1999 Montana ESEA Title II Eisenhower Study

Teacher Self-Assessment of Content Knowledge and Student Performance
With Regard To Montana's Reading and Mathematics Content Standards
And
Survey of Professional Development Quality

☜ COMPREHENSIVE REPORT OF
PROFESSIONAL DEVELOPMENT NEEDS ☜

Montana Office of Public Instruction
Nancy Keenan, Superintendent
PO Box 202501
Helena, MT 59620-2501

The 1999 Montana ESEA Title II Eisenhower Study, including Comprehensive Report and Appendices, is available on-line at http://www.metnet.state.mt.us (click on "Our Services" then arrow down to "Title II"). It is available in hard copy upon request by contacting the Eisenhower Professional Development Program office at (406) 444-1852.

1999 Montana ESEA Title II Eisenhower Study

Acknowledgements

Project Director/Editor
Christine Provance
Division of Educational Opportunity and Equity
Title II Eisenhower Professional Development Program

Survey Design
Montana Eisenhower Advisory Team (MEAT)
Survey Design Subcommittee

Nancy Coopersmith
OPI Administrator-Curriculum Services Department

Dr. Linda Peterson
OPI Administrator- School Improvement Division

Data Collection
Dick Dodge
Dodge Data Systems
Helena, Montana

Data Analysis/Recommendations
Montana Eisenhower Advisory Team (MEAT)
Mathematics/PD Quality Survey Analysis Subcommittee

Montana State Reading Council (MSRC)
Reading Survey Analysis Subcommittee

Subcommittee Facilitation
Christine Provance
June Atkins

MEAT Survey Development Subcommittee
Mike Birrer
Carol Blades
Larry Gursky
Alicia Moe
Dr. Claudette Morton
Dennis Parman
Fred Siedensticker

MEAT Survey Analysis Subcommittee
Holly Blanden
Mike Birrer
Erik Burke
Fred Longhart
Karen Longhart
Colleen Mercer
John Miller
Annette Moody
Fred Siedensticker
Dick Seitz
Karen Stout-Suenram

MSRC Survey Analysis Subcommittee
Odetta Arcand
Jerrie Boksich
Jerry Guay
Dr. Arlene Hett
Sarah McGill
Connie Metcalfe
Melody Nansel
Ron Scherry
Sue Stanton

Consultation/Review
Dr. Maurice Burke
Dr. Jan Clinard
Nancy Coopersmith
Marsha Davis
BJ Granbery
Michael Hall
Dr. Ted Hodgson
Mike Jetty
MEAT
Dr. Linda Peterson
Spencer Sartorius

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PROJECT DIRECTOR'S NOTE

"Whatever the combination of uses, the role of systemic analysis of need is reduction of uncertainty." Jack McKillip

The enormous amount of information collected and analyzed through the 1999 Montana ESEA Title II Eisenhower Study gives one the understanding of the complex nature of identifying professional development needs, and prioritizing those needs so that focused, long-term, job-embedded professional development can occur. This report was written in order to establish base-line data prior to the initiation of any large-scale professional development initiative in the state. A follow-up teacher self-assessment of the Mathematics and Reading Standards is scheduled to be conducted in the spring of 2004 in order to measure the impact of the professional development opportunities offered since the 1999 survey.

The ESEA Eisenhower Title II program views this study as one tool in an ongoing, continually evolving collaborative inquiry process. If you have recommendations or suggestions for improving the manner in which this data is communicated, please contact the Title II Program office through our **METNET** site (see cover for address).

While this study was designed to provide base-line data concerning teacher needs for professional development, it is important to remember and recognize current strengths of the Montana ESEA Title II Eisenhower program. For a summary of current program strengths, needs identified for improvement, and recommendations for initiatives, please see the **EXECUTIVE SUMMARY,** also available at our **METNET** site.

FUTURE EFFORTS

Districts should not take lightly the task of establishing goals and objectives for professional development. Without data to support need, there is a very strong possibility that needs will go unmet and ALL teachers will not be prepared to teach ALL students to high standards. A report of district response data was sent to each participating district in June of 1999 (See Appendix C). The use of district response data will help districts focus professional development on local needs.

Using the framework established by the Montana Eisenhower Advisory Team in 1999, the state should consider conducting similar studies for each of the core content areas. The target date of spring 2001 has been set for a Title II Eisenhower Teacher Self-Assessment of the content and skills within the Science and Technology Standards. A follow-up science and technology teacher self-assessment will be conducted in the spring of 2005 to determine professional development impact. Prior to any further comprehensive studies, Montana's Title II Eisenhower Program is committed to the development of an on-line data collection and analysis process. On-line teacher self-assessments will be piloted in two districts and one regional curriculum consortium in the spring of 2000. No other content area self-assessments are planned as of this date.

Although much uncertainty of current professional development needs was eliminated through the 1999 Montana ESEA Title II Eisenhower Study, further inquiry will lead to understanding the reasons for some of the more startling findings. The author recommends focus group interviews with the following format:

- Kindergarten and grade 1 teachers discussing their role in the teaching of reading with regard to State Standards Benchmarks.
- Grades 9-12 high school teachers discussing their role in the teaching of reading with regard to State Standards Benchmarks.
- Grades K-12 teachers, in standards level subgroups, discussing their current resources for teaching probability and statistics and geometry for ALL students.
- Grades 9-12 teachers discussing the nature and quality of their own professional development.
- School administration and central office staff discussing their understanding of job-embedded, on-going professional development.

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COMPREHENSIVE REPORT OF PROFESSIONAL DEVELOPMENT NEEDS

Background Information

In April of 1999, the Montana Eisenhower Program conducted a comprehensive survey to determine mathematics and reading content and pedagogy needs of Kindergarten – grades 12 (K-12) teachers of mathematics and reading. The survey also provided a means to evaluate professional development quality with regard to the Montana Eisenhower Program's four indicators of quality.

Study Intent

The Montana ESEA Title II Professional Development Study is a tool to assist in planning state and district professional development as the state and districts transition from Montana's Model Learner Goals to Montana's Content and Student Performance Standards. Once state and district assessments are aligned to the standards, student achievement data will be used as a primary planning tool. The survey will also be used for longitudinal studies and as a complementary planning tool. Implementation of the survey will also provide grades K-12 teachers of mathematics and reading the opportunity to reflect on the newly revised Montana Mathematics and Reading Content Standards.

Study Objectives

1. Identify needs related to teacher content knowledge of the concepts and skills (benchmarks) in the newly revised Mathematics and Reading Content Standards.
2. Identify current instructional challenges found within the Mathematics and Reading Standards.
3. Identify grade levels that **DO** and do **NOT** currently teach the benchmarks found within the Mathematics and Reading Standards.
4. Identify areas for improvement of overall professional development quality.

Survey Development

- Planning for the survey began after statewide program analysis of the district Eisenhower Final Program Reports in December of 1998. The Montana Eisenhower Advisory Team (MEAT) established a need to verify the final program analysis with teacher response data. It was determined, at that time, that content needs for mathematics teachers should be identified as well.
- The content component idea of the survey was then taken to Montana's School Improvement Division. The School Improvement Division administrator requested that Montana's newly revised content standards be used to identify professional development needs around the content and skills found in the standards.
- Further discussions with the Office of Public Instruction's (OPI) Curriculum Services Department administrator led to the inclusion of the Reading Content Standards and Benchmarks.
- A subcommittee of the MEAT met in January of 1999 in order to create a final draft of the survey. The subcommittee decided to use the National Staff Development Council Standards for Staff Development (NSDC 1995) as the basis for 14 response prompts regarding the quality of staff development. These 14 prompts were selected from the NSDC Standards because of their strong alignment to Montana's Eisenhower Objectives (see Appendix A). After consulting with Montana's School Improvement administrator, the response prompts were then edited and modified to align with the Office of Educational Research and Improvement (OERI) principles of high-quality professional development (see Appendix B).

Implementation

- During the March 1999 regional Montana Association of School Superintendents (MASS) meetings, each district superintendent received an invitation to participate in the Eisenhower Survey. A packet with a description of objectives and responsibilities, along with a survey order form to be returned to the OPI Eisenhower specialist, was distributed. Survey invitations and packets were mailed to all superintendents who did not attend their regional MASS meeting.
- During the month of April, instructions for proper survey administration were sent to participating superintendents and principals. Each principal received a script and was asked to personally deliver and explain the survey to their building teachers.
- A thank you card was sent to each participating teacher the week prior to delivery of the survey. This card explained the purpose of the survey and thanked the teachers in advance for taking the time to complete the document.

Increased Awareness of Standards through Survey Implementation

Approximately 614 of the teachers surveyed had reviewed the Reading and/or Mathematics Content Standards prior to completing the survey. There were 1433 teachers who read and reflected on the standards for the first time. An average of 30 percent of both the reading and mathematics teachers surveyed at all grade levels were aware of the new standards.

Rate of Response

The primary intent of the survey was to gather baseline census data for each district. Districts were required to return 75 percent of the reading and mathematics surveys they requested in order to receive a data report. The OPI delivered 2,823 total surveys:

- 2,047 were returned;
- rate of response was 73 percent (see following tables);
- 2,047 grades K-12 teachers responded to the survey;
- 1,131 grades K-4 teachers responded;
- 625 grades 5-8 teachers responded; and
- 291 grades 9-12 teachers responded.

Profile of Responding Districts by Size (see Appendix D for Size Category descriptions)

Participating districts represented all levels of size, demographics, and locations throughout Montana (see following tables).

- The largest percentages of participating districts were elementary districts with greater than 2,500 students (Size Category 1E) and high school districts with greater than 1,250 students (Size Category 1H). Seventy-seven percent of the 12 Size 1E and 1H districts participated.
- The second largest percentages of participating districts were in the third size category with 401-850 elementary students (Size Category 3E) and 204-400 high school students (Size Category 3H). Thirty-nine percent of the 44 Size 3E and 3H districts participated.
- The smallest percentages of participating districts were elementary schools of fewer than 40 students (Size Category 6E). With the exception of the Size 6E, at least 15 percent of all districts of each size participated in the survey.

Profile of Regional Participation (see Appendix C for list of participating districts).

There are nine designated Montana Association of School Superintendents (MASS) Regions in Montana.

- The largest percentages of participating districts were from the Northwest MASS Region, with 88 percent of its eight districts participating.
- The second largest percentages of participating districts were from the Central MASS Region with 50 percent of its districts participating.
- The smallest percentages of participating districts were in the Hi-Line MASS Region.
- With the exception of the Hi-Line region, 15 percent of the districts in each MASS Region participated in this survey (see Appendix E for MASS Regions).

Limitations

This data was not drawn from a random sampling; thus, information will most accurately reflect the needs of participating districts.

Participating Teachers of Mathematics and Reading
By Grade Level

Grade Level(s) Taught	Number In State *	Number Participating in Survey	Number of Math Respondents	Number Of Reading Respondents	Percentage Of State Total Participants*
K-4	3,622	1,131	1,065	1,037	32%
5-8	1,979	625	505	475	32%
9-12	981	291	221	101	30%

*All totals are approximations

- The number of teachers in each grade level is an estimation derived from the Montana Statewide Educational Profile (see Appendix B).
- Totals for grades 5-8 were taken from grades 5 and 6 self-contained and grades 7 and 8 mathematics, English and Title I.
- Totals for grades 9-12 were taken from mathematics, English and Title I.

Participating Districts by Size

(See Appendix D for Size of Categories and Distribution throughout State)

District Size Category	Total Number of This Size in Montana	Total Number of Participating Survey Districts	% of This Category Participating
1E and/or H	14	10	77%
2E and/or H	37	8	22%
3E and/or H	44	17	39%
4E and/or H	102	10	10%
5E and/or H	106	16	15%
6E and/or H	113	2	2%
1K	12	4	34%
2K	34	5	15%
TOTALS *	362	74	20%

*Number of districts of each size was taken from the Montana Statewide Education Profile. Elementary and High School districts were counted separately for this table.

Participating Districts by MASS Region

(See Appendix E for Map of MASS Region)

MASS Region	Total Number of Participating Teachers	Total Number of Participating Districts *	Total Number of Districts in Region *	% of MASS Region Districts Participating in Survey
4 Rivers	93	4	28	15%
South Central	471	7	26	27%
North Central	425	3	21	15%
South East	79	5	14	36%
Central	156	6	12	50%
North West	197	7	8	88%
Western	362	8	26	31%
North East	193	6	27	23%
Hi Line	71	1	13	8%
TOTALS *	2047	45	167	27%

* The MASS Rregion “districts” are combined K-12, if appropriate.

Part 1 – Teacher Self-Assessment
Kindergarten – Grade 12 Mathematics

Response Options

Grades K-12 teachers surveyed were asked to respond in two ways to each benchmark within their grade-level mathematics content standards.

1. Teachers were asked to rank the comfort they felt with regard to their own content knowledge.
2. Teachers were asked to respond whether or not they introduced, taught, or reviewed the benchmark (reported as "**NOT** teaching"), and those who currently teach the benchmark were asked to report how difficult they felt the information was for students to learn.

Identification of Professional Development Priorities

In order to identify professional development priorities the Eisenhower Mathematics Teacher Self-Assessment Review Committee determined a level of concern for each response category. These levels of concern vary from category to category and from benchmark level to benchmark level. For example, grades K-4 teachers felt more comfortable with their student's ability to learn the mathematics concepts. In order to prioritize benchmarks for professional development, the committee determined the benchmark was "of concern" if 25 percent of the teachers responded that students had a difficult time learning the concept or skill. In grades 5-8, however, almost all the benchmarks were identified as difficult for students to learn by 25 percent of the teachers, thus, the level of concern was raised to 40 percent.

NOTE: The benchmarks in the tables do **NOT** represent **ALL** of the benchmarks. **ONLY** those that are of concern are listed. For a complete report of **ALL** response data go to the on-line reports at http://www.metnet.state.mt.us.

Kindergarten – Grade 4 Mathematics Findings

The following tables illustrate benchmarks that present a concern because of the number of teachers who are uncomfortable with content, and the number of teachers who are either **NOT** teaching the benchmark **or if** teaching, say that even with instruction and practice, students are having a difficult time learning the identified concepts and skills.

Legend: Each benchmark of concern is labeled in the following table with one of two symbols.

● Indicates benchmarks that teachers feel **uncomfortable** with regard to content and report **NOT** teaching **or if** teaching, say students have a difficult time learning.

∞ Indicates benchmarks that teachers **DO** feel **comfortable** with regard to content, but report **NOT** teaching **or if** teaching, say students have a difficult time learning.

STANDARD 1: Students engage in the mathematical process of problem solving and reasoning, estimation, communication, connections and applications, and using appropriate technology.	**% Of Grades K-4 Teachers Uncomfortable With Their Content Knowledge**			**Over 20% Of Teachers Surveyed Do NOT Teach The Benchmark**					**Over 25% Of Teachers Who DO Teach Say Students Have A Difficult Time Learning The Benchmark**				
	Percentage			**Grades**					**Grades**				
	10-15	**16-20**	**>20**	**K**	**1**	**2**	**3**	**4**	**K**	**1**	**2**	**3**	**4**
1.1 apply estimation strategies throughout the problem solving process.									∞	∞	∞		∞

STANDARD 2: Students demonstrate an understanding of and an ability to use numbers and operations.	**% Of Grades K-4 Teachers Uncomfortable With Their Content Knowledge**			**Over 20% Of Teachers Surveyed Do NOT Teach The Benchmark**					**Over 25% Of Teachers Who DO Teach Say Students Have A Difficult Time Learning The Benchmark**				
	Percentage			**Grades**					**Grades**				
	10-15	**16-20**	**>20**	**K**	**1**	**2**	**3**	**4**	**K**	**1**	**2**	**3**	**4**
2.4 model and explain multiplication and division of whole numbers.				∞	∞	∞			∞	∞	∞		

STANDARD 3: Students use algebraic concepts, processes, and language to model and solve a variety of real-world mathematical problems.	**% Of Grades K-4 Teachers Uncomfortable With Their Content Knowledge**			**Over 20% Of Teachers Surveyed Do NOT Teach The Benchmark**					**Over 25% Of Teachers Who DO Teach Say Students Have A Difficult Time Learning The Benchmark**				
	Percentage			**Grades**					**Grades**				
	10-15	**16-20**	**>20**	**K**	**1**	**2**	**3**	**4**	**K**	**1**	**2**	**3**	**4**
3.1 use symbols to represent number system by counting, grouping and applying place value concepts.	●			●	●							●	●
3.2 explore the use of variables and open sentences to express relationships.				∞	∞				∞	∞	∞	∞	∞
3.3 use inverse operations and other strategies to solve number sentences.									∞	∞			

STANDARD 4: Students demonstrate an understanding of shape and an ability to use geometry.	**% Of Grades K-4 Teachers Uncomfortable With Their Content Knowledge**			**Over 20% Of Teachers Surveyed Do NOT Teach The Benchmark**					**Over 25% Of Teachers Who DO Teach Say Students Have A Difficult Time Learning The Benchmark**				
	Percentage			**Grades**					**Grades**				
	10-15	**16-20**	**>20**	**K**	**1**	**2**	**3**	**4**	**K**	**1**	**2**	**3**	**4**
4.2 investigate and predict results of combining, subdividing and changing shapes.		●		●	●	●			●	●	●	●	●
4.3 identify lines of symmetry, congruent and similar shapes and positional relationships**.**									∞	∞			

STANDARD 5: Students demonstrate an understanding of measurable attributes and an ability to use measurement processes.	**% Of Grades K-4 Teachers Uncomfortable With Their Content Knowledge**			**Over 20% Of Teachers Surveyed Do NOT Teach The Benchmark**					**Over 25% Of Teachers Who DO Teach Say Students Have A Difficult Time Learning The Benchmark**				
	Percentage			**Grades**					**Grades**				
	10-15	**16-20**	**>20**	**K**	**1**	**2**	**3**	**4**	**K**	**1**	**2**	**3**	**4**
5.1 estimate, measure, and investigate length, capacity, weight, mass, area, volume, time and temperature.									∞	∞	∞	∞	∞
5.2 develop the process of measuring and concepts related to units of measurement, including standard units (English and Metric) and nonstandard units.				∞							∞	∞	∞
5.4 select and use appropriate tools and techniques (for measuring).				∞									∞

STANDARD 6: Students demonstrate an understanding of and an ability to use data analysis, probability, and statistics.	**% Of Grades K-4 Teachers Uncomfortable With Their Content Knowledge**			**Over 20% Of Teachers Surveyed Do NOT Teach The Benchmark**					**Over 25% Of Teachers Who DO Teach Say Students Have A Difficult Time Learning The Benchmark**				
	Percentage			**Grades**					**Grades**				
	10-15	**16-20**	**>20**	**K**	**1**	**2**	**3**	**4**	**K**	**1**	**2**	**3**	**4**
6.1 collect, organize and display data.									∞	∞	∞		
6.3 formulate and solve problems that involve collecting and analyzing data.				∞					∞	∞	∞	∞	∞
6.4 demonstrate basic concepts of chance**.**		●		●	●				●	●	●	●	●

STANDARD 7: Students demonstrate an understanding of and an ability to use patterns, relations, and functions.	**% Of Grades K-4 Teachers Uncomfortable With Their Content Knowledge**			**Over 20% Of Teachers Surveyed Do NOT Teach The Benchmark**					**Over 25% Of Teachers Who DO Teach Say Students Have A Difficult Time Learning The Benchmark**				
	Percentage			**Grades**					**Grades**				
	10-15	**16-20**	**>20**	**K**	**1**	**2**	**3**	**4**	**K**	**1**	**2**	**3**	**4**
7.2 represent and describe mathematical and real-world relationships.									∞	∞	∞	∞	∞

Primary teachers, grades K-4, had fewer concerns about their own content knowledge regarding the mathematics standards than teachers of grades 5-8 students or grades 9-12 students. They also had fewer concerns about the ease of student learning with regard to the standards.

Teacher Content Needs

Of the elementary teachers (K-4) surveyed who were uncomfortable with their own content knowledge:

- 19 percent were uncomfortable demonstrating basic concepts of chance **(Benchmark 6.4**);
- 20 percent were uncomfortable with investigating and predicting results of combining, subdividing and changing shapes (**Benchmark 4.2**);
- 11 percent were uncomfortable with using symbols to represent number system by counting, grouping and applying place value concepts (**Benchmark 3.1**);
- 25 percent or more of surveyed teachers at grade levels K-4 reported it difficult for students to learn **Benchmarks 6.4** and **4.2**; and
- 20 percent or more of Kindergarten and grade 1 teachers are **NOT** currently teaching **Benchmarks 6.4** and **4.2**.

Overall, teachers were more concerned about the difficulty of student learning with regard to **Standard 4**, "Students demonstrate an understanding of shape and an ability to use geometry," and **Standard 6**, "Students demonstrate an understanding of and an ability to use data analysis, probability, and statistics" than all other Mathematics Standards.

Current Instructional Challenges

Of the standards, teachers who **DO** feel comfortable in regard to their own content knowledge reported that students have the most difficulty learning **Standard 5**, "Students demonstrate understanding of measurable attributes and an ability to use measurement processes." In addition to the instructional challenge within **Standard 5**, teachers report that even with instruction and practice, students have a difficult time learning to apply estimation strategies throughout the problem solving process **(Benchmark 1.1**) and to represent and describe mathematical and real-world relationships (**Benchmark 7.2**).

Recommendations for Kindergarten – Grade 4 Mathematics

The need for a systemic, content-rich professional development initiative to raise Kindergarten through grade 4 teacher content knowledge in the areas of data analysis, geometry, and algebra is evident in the findings of this survey. Teachers who are **NOT** comfortable with their content knowledge are also either **NOT** teaching the benchmarks **or if** teaching, say that students have a difficult time learning the concept or skill.

Any entity involved in long-range professional development planning in the area of mathematics in the primary grades should address these three critical areas in order to build the capacity of ALL primary grade teachers to teach ALL primary grade students to high standards. Preservice, as well as ongoing professional development initiatives, should view these three areas of mathematics (data analysis, geometry and algebra) as priorities for focused, content-rich course work and professional development. Partnerships between mathematics professors, mathematics education professors and Montana districts must be developed in order to address these content issues in a timely fashion. District curriculum planning should involve thoughtful dialogue about appropriate scope and sequence with regard to these three standards regardless of textbook content. Additional materials and/or new teaching materials may be necessary when planning curriculum aligned to Montana's Student Content and Performance Standards. Statewide and district assessments should also be evaluated for their ability to assess the content and skills within these benchmarks. The benchmarks within these standards are of higher-order thinking skills and may be difficult to assess with paper and pencil tests.

Although the same attention to scope, sequence, methodology, and assessment should take place around **Standard 5**, "Students demonstrate understanding of measurable attributes and an ability to use measurement processes" intensive, short-term intervention-type professional development may be sufficient to build teaching capacity in these areas. **Benchmark 1.1** and **Benchmark 7.2** should also be addressed through such professional development. Professional development venues such as MEA days, national and regional conferences and summer institutes may provide adequate awareness and application-level professional development. Long-term, job-embedded support mechanisms such as peer coaching, study groups, and collaborative problem solving must precede any of these opportunities for teachers to successfully implement new strategies.

Grades 5 – 8 Mathematics Findings

The following table illustrates benchmarks that present a concern because of the number of teachers feeling uncomfortable with content, and the number of teachers who are either **NOT** teaching the benchmark **or if** teaching, say that even with instruction and practice, students are having a difficult time learning the identified concepts and skills.

Legend: Each benchmark of concern is labeled in the following table with one of two symbols.
● Indicates benchmarks that teachers feel **uncomfortable** with regard to content and report **NOT** teaching **or if** teaching, say students have a difficult time learning.
∞ Indicates benchmarks that teachers **DO** feel **comfortable** with regard to content, but report **NOT** teaching **or if** teaching, say students have a difficult time learning.

STANDARD 1: Students engage in the mathematical process of problem solving and reasoning, estimation, communication, connections and applications, and using appropriate technology.	**% Of Grades 5-8 Teachers Who Feel Uncomfortable With Their Content Knowledge**			**Over 20% Of Teachers Surveyed Do NOT Teach The Benchmark**				**Over 40% Of Teachers Who DO Teach Say Students Have A Difficult Time Learning The Benchmark**			
	Percentage			**Grades**				**Grades**			
	10-15	**16-20**	**>20**	**5**	**6**	**7**	**8**	**5**	**6**	**7**	**8**
1.1 formulate and solve multi-step and non-routine problems using a variety of strategies. Generalize methods to new problems and situations.										∞	∞

STANDARD 2: Students demonstrate an understanding of and an ability to use numbers and operations.	**% Of Grades 5-8 Teachers Who Feel Uncomfortable With Their Content Knowledge**			**Over 20% Of Teachers Surveyed Do NOT Teach The Benchmark**				**Over 40% Of Teachers Who DO Teach Say Students Have A Difficult Time Learning The Benchmark**			
	Percentage			**Grades**				**Grades**			
	10-15	**16-20**	**>20**	**5**	**6**	**7**	**8**	**5**	**6**	**7**	**8**
2.3 use the relationships and applications of ratio, proportion, percent, and scientific notation.								∞	∞	∞	

STANDARD 3: Students use algebraic concepts, processes, and language to model and solve a variety of real-world mathematical problems.	**% Of Grades 5-8 Teachers Who Feel Uncomfortable With Their Content Knowledge**			**Over 20% Of Teachers Surveyed Do NOT Teach The Benchmark**				**Over 40% Of Teachers Who DO Teach Say Students Have A Difficult Time Learning The Benchmark**			
	Percentage			**Grades**				**Grades**			
	10-15	**16-20**	**>20**	**5**	**6**	**7**	**8**	**5**	**6**	**7**	**8**
3.1 understand concept of variable, expression and equation.								∞	∞	∞	
3.4 solve linear equations using concrete, numerical and algebraic methods.				∞	∞			∞	∞	∞	
3.5 investigate inequalities and nonlinear relationships informally**.**			●	●	●			●	●	●	

STANDARD 4: Students demonstrate an understanding of shape and an ability to use geometry.	**% Of Grades 5-8 Teachers Who Feel Uncomfortable With Their Content Knowledge**			**Over 20% Of Teachers Surveyed Do NOT Teach The Benchmark**				**Over 40% Of Teachers Who DO Teach Say Students Have A Difficult Time Learning The Benchmark**			
	Percentage			**Grades**				**Grades**			
	10-15	**16-20**	**>20**	**5**	**6**	**7**	**8**	**5**	**6**	**7**	**8**
4.2 understand and apply geometric properties and relationships (Pythagorean Theory).		●		●	●			●	●	●	
4.3 represent geometric figures on a coordinate grid.	●			●	●	●				●	
4.4 explore properties and transformations of geometric figures.		●		●	●	●				●	
4.5 use geometry to describe the physical world.			∞			∞					

STANDARD 5: Students demonstrate an understanding of measurable attributes and an ability to use measurement processes.	**% Of Grades 5-8 Teachers Who Feel Uncomfortable With Their Content Knowledge**			**Over 20% Of Teachers Surveyed Do NOT Teach The Benchmark**				**Over 40% Of Teachers Who DO Teach Say Students Have A Difficult Time Learning The Benchmark**			
	Percentage			**Grades**				**Grades**			
	10-15	**16-20**	**>20**	**5**	**6**	**7**	**8**	**5**	**6**	**7**	**8**
5.4 demonstrate understanding of and the structure and use of systems of measurement, including English and metric.							∞			∞	
5.5 use concepts of rates and other derived and indirect measurements.				∞	∞			∞	∞	∞	

STANDARD 6: Students demonstrate an understanding of and an ability to use data analysis, probability, and statistics.	**% Of Grades 5-8 Teachers Who Feel Uncomfortable With Their Content Knowledge**			**Over 20% Of Teachers Surveyed Do NOT Teach The Benchmark**				**Over 40% Of Teachers Who DO Teach Say Students Have A Difficult Time Learning The Benchmark**			
	Percentage			**Grades**				**Grades**			
	10-15	**16-20**	**>20**	**5**	**6**	**7**	**8**	**5**	**6**	**7**	**8**
6.3 draw inferences, construct, and evaluate arguments based on data analysis and measures of central tendency.	●			●	●	●		●	●	●	●
6.4 construct sample spaces and determine the theoretical and experimental probabilities of events.			●	●	●			●	●	●	
6.5 make predictions based on experimental results or probabilities.				∞	∞				∞	∞	

STANDARD 7: Students demonstrate an understanding of and an ability to use patterns, relations, and functions.	% Of Grades 5-8 Teachers Who Feel Uncomfortable With Their Content Knowledge			Over 20% Of Teachers Surveyed Do NOT Teach The Benchmark				Over 40% Of Teachers Who DO Teach Say Students Have A Difficult Time Learning The Benchmark			
	Percentage			Grades				Grades			
	10-15	16-20	>20	5	6	7	8	5	6	7	8
7.1 describe, extend, analyze, and create a variety of patterns and functions.				∞		∞			∞	∞	
7.3 analyze functional relationships to explain how a change in one quantity results in a change in another.	●			●	●	●		●	●	●	
7.5 describe functions using graphical, numerical, physical, algebraic, and verbal models			●	●	●	●		●	●	●	●

Teacher Content Needs

Middle grade teachers (5-8) had more concerns about their own content comfort than grades K-4 teachers and fewer concerns about their content comfort than grades 9-12 teachers with regard to the Mathematics Standards. Three standards stand out as clear priorities for content-rich professional development. These are:

1. **Standard 4**, "Students demonstrate understanding of shape and an ability to use geometry";
2. **Standard 7**, "Students demonstrate understanding of and ability to use patterns, relations, and functions"; and
3. **Standard 6**, "Students demonstrate an understanding of and an ability to use data analysis, probability, and statistics."

Current Instructional Challenges

Of the standards, teachers who **DO** feel comfortable concerning their own content knowledge, **Standard 3**, "Students use algebraic concepts, processes, and language to model and solve a variety of real-world mathematical problems," and **Standard 5**, "Students demonstrate understanding of measurable attributes and an ability to use measurement processes," were current instructional challenges.

In addition to the concerns listed above, grade 7 teachers reported students have a difficult time formulating and solving multi-step and non-routine problems using a variety of strategies **(Benchmark 1.1**), and using the relationships and applications of ratio, proportion, percent, and scientific notation (**Benchmark 2.3**).

Recommendations for Grades 5 – 8 Mathematics

The need for a statewide, long-term effort to raise middle grade teacher content knowledge in the areas of geometry **(Standard 4**); patterns, relations, and functions (**Standard 7**); and data analysis, probability, and statistics (**Standard 6**), is clearly evident. Any entity involved in long-range professional development planning in the area of mathematics in the middle grades must address these three critical areas of concern in order to build the capacity of ALL middle grade teachers to teach ALL middle grade students to high standards. Preservice, as well as ongoing professional development initiatives, should view these three areas of mathematics as priorities for focused, content-rich professional development. Partnerships between mathematics professors, mathematics education professors and Montana districts must be developed in order to address these content issues in a timely fashion. District curriculum planning should involve thoughtful dialogue about appropriate scope and sequence with regard to these three standards regardless of textbook content. Additional materials and/or new teaching materials may be necessary when planning curriculum aligned to Montana's Student Content and Performance Standards. Statewide and district assessments should also be evaluated for their ability to assess the content and skills within these benchmarks. The benchmarks within these standards are of higher-order thinking skills, and may be difficult to assess with paper and pencil tests.

Although the same attention to scope, sequence, methodology, and assessment should take place around **Standard 3** and **Standard 5**, intensive short-term intervention-type professional development may be sufficient to build teaching capacity in these areas. **Benchmarks 1.1** and **2.3** should also be addressed through such professional development. Professional development venues such as MEA days, national and regional conferences, and summer institutes may provide adequate awareness and application-level professional development. Long-term, job-embedded support mechanisms such as peer coaching, study groups, and collaborative problem solving must precede any of these opportunities for teachers to successfully implement these strategies.

Integration of difficult Mathematics Standards into science, technology, and applied science classes will also prove to be beneficial to students who have a difficult time learning the content or skill. Real-world application of data analysis, statistics, proportions and measurements seems a natural fit for this type of integration. Cross-curricular teams of teachers working together to assist ALL students in the learning of these concepts and skills may go far in solving the problems of successful teaching of the Mathematics Standards.

First and foremost, however, is the need to address the lack of content comfort many middle grade teachers are experiencing as they attempt to implement Montana's newly revised Mathematics Standards. A teacher who does not have a high level of understanding of mathematics will only be able to teach the mechanics of mathematics and will not be able to help students synthesize their understanding of mathematics concepts.

Grades 9 – 12 Mathematics Findings

High school teachers teaching ALL students reported the greatest concern with regard to their own content knowledge. It is important to note that all high school math teachers who teach classes open to ALL students were surveyed regarding content comfort of all of the benchmarks. For example, teachers teaching algebra were asked to respond to their content comfort in the area of probability and statistics. The responses of 114 teachers of mathematics for ALL students are represented in these findings.

The following table illustrates benchmarks that present a concern because of the number of teachers feeling uncomfortable with content, and the number of teachers who are either **NOT** teaching the benchmark **or if** teaching, say that even with instruction and practice, students are having a difficult time learning the concepts and skills.

Legend: Each benchmark of concern is labeled in the following table with one of two symbols.
● Indicates benchmarks that teachers feel **uncomfortable** with regard to content and report **NOT** teaching **or if** teaching, say students have a difficult time learning.
∞ Indicates benchmarks that teachers **DO** feel **comfortable** with regard to content, but report **NOT** teaching **or if** teaching, say students have a difficult time learning.

STANDARD 1: Students engage in the mathematical process of problem solving and reasoning, estimation, communication, connections and applications, and using appropriate technology.	**% Of Grades 9-12 Teachers Teaching Classes Open To ALL Students Uncomfortable With Their Content Knowledge**			**% Of Teachers Who Do NOT Teach The Benchmarks In Classes Open to ALL Students**			**% Of Teachers Teaching ALL Students Who Say Students Have A Difficult Time Learning The Benchmark**		
	Percentage			**Percentage**			**Percentage**		
	10-15	**16-20**	**>20**	**20-25**	**26-30**	**>30**	**30-35**	**36-40**	**>40**
1.3 formulate definitions, make and justify inferences, express generalizations, and communicate mathematical ideas and relationships.							∞		
1.4 apply and translate among different representations of the same problem situation or of the same mathematical concept. Model connections between problem situations that arise in disciplines other than mathematics.							∞		

STANDARD 3: Students use algebraic concepts, processes, and language to model and solve a variety of real-world mathematical problems.	**% Of Grades 9-12 Teachers Teaching Classes Open To ALL Students Uncomfortable With Their Content Knowledge**			**% Of Teachers Who Do NOT Teach The Benchmarks In Classes Open to ALL Students**			**% Of Teachers Teaching ALL Students Who Say Students Have A Difficult Time Learning The Benchmark**		
	Percentage			**Percentage**			**Percentage**		
	10-15	**16-20**	**>20**	**20-25**	**26-30**	**>30**	**30-35**	**36-40**	**>40**
3.5 Use algebraic models to solve mathematical and real-world problems.							∞		

STANDARD 4: Students demonstrate an under-Standing of shape and an ability to use geometry.	**% Of Grades 9-12 Teachers Teaching Classes Open To ALL Students Uncomfortable With Their Content Knowledge**			**% Of Teachers Who Do NOT Teach The Benchmarks In Classes Open to ALL Students**			**% Of Teachers Teaching ALL Students Who Say Students Have A Difficult Time Learning The Benchmark**		
	Percentage			**Percentage**			**Percentage**		
	10-15	**16-20**	**>20**	**20-25**	**26-30**	**>30**	**30-35**	**36-40**	**>40**
4.3 translate between synthetic and coordinate representations.									∞
4.4 deduce properties of figures using transformations, coordinates and vectors in problem solving									∞

STANDARD 5: Students demonstrate an understanding of measurable attributes and an ability to use measurement processes.	% Of Grades 9-12 Teachers Teaching Classes Open To ALL Students Uncomfortable With Their Content Knowledge			% Of Teachers Who Do NOT Teach The Benchmarks In Classes Open to ALL Students			% Of Teachers Teaching ALL Students Who Say Students Have A Difficult Time Learning The Benchmark		
	Percentage			Percentage			Percentage		
	10-15	16-20	>20	20-25	26-30	>30	30-35	36-40	>40
5.2 use dimensional analysis to check reasonableness of procedures.	●			●					●
5.3 investigate systems of derived measures.				∞					
5.4 apply the appropriate concepts of estimates in measurement, error in measurement, tolerance, and precision.	●			●				●	

STANDARD 6: Students demonstrate an understanding of and an ability to use data analysis, probability, and statistics.	% Of Grades 9-12 Teachers Teaching Classes Open To ALL Students Uncomfortable With Their Content Knowledge			% Of Teachers Who Do NOT Teach The Benchmarks In Classes Open to ALL Students			% Of Teachers Teaching ALL Students Who Say Students Have A Difficult Time Learning The Benchmark		
	Percentage			Percentage			Percentage		
	10-15	16-20	>20	20-25	26-30	>30	30-35	36-40	>40
6.1 use curve fitting to make predictions from data.	●			●					
6.2 apply measures of central tendency and demonstrate understanding of the concepts of variability and correlation.	●			●					
6.3 select an appropriate sampling method for a given statistical analysis.		●				●			●
6.4 use experimental probability, theoretical probability, and simulation methods to represent and solve problems, including expected values.		●		●			●		
6.5 design a statistical experiment to study a problem and communicate the outcomes.			●			●		●	
6.6 describe, in general terms, the normal curve and use its properties to answer questions about a set of data that are assumed to be normally distributed.						●			

STANDARD 7: Students demonstrate an understanding of and an ability to use patterns, relations, and functions.	% Of Grades 9-12 Teachers Teaching Classes Open To ALL Students Uncomfortable With Their Content Knowledge			% Of Teachers Who Do NOT Teach The Benchmarks In Classes Open to ALL Students			% Of Teachers Teaching ALL Students Who Say Students Have A Difficult Time Learning The Benchmark		
	Percentage			Percentage			Percentage		
	10-15	16-20	>20	20-25	26-30	>30	30-35	36-40	>40
7.3 analyze the effects of parameter changes on graphs of functions and relations, including translations.	●				●				
7.5 use graphing for parametric equations, three-dimensional equations, and recursive relations.			●			●			●

Teacher Content Needs

- One standard that stands out as a clear priority for content-rich, sustained professional development is **Standard 6**, "Students demonstrate an understanding of and an ability to use data analysis, probability and statistics."
- Two additional standards that should also be priorities for content-rich professional development for ALL high school mathematics teachers are **Standard 5**, " Students demonstrate an understanding of measurable attributes and an ability to use measurement processes," and **Standard 7**, "Students demonstrate an understanding of and an ability to use patterns, relations, and functions."

Current Instructional Challenges

Of the standards that teachers **DO** feel comfortable in regard to their own content knowledge, **Standard 1**, "Students engage in the mathematical process of problem solving and reasoning, estimation, communication and applications, and using appropriate technology," was reported as difficult for students to learn even with instruction and practice.

In addition to the concerns listed above, high school teachers reported student learning difficulties in:

- **Benchmark 3.3**, solving algebraic equations and inequalities: linear, quadratic, exponential, logarithmic, and power;
- **Benchmark 4.3**, to translate between synthetic and coordinate representations; and
- **Benchmark 4.4**, deduce properties of figures using transformations, coordinates and vectors in problem solving.

Recommendations for Grades 9 – 12 Mathematics

The need for a comprehensive, long-term effort to raise the teacher content knowledge of high school teachers teaching mathematics to ALL students in the areas of data analysis, probability, and statistics (**Standard 6**), measurement (**Standard 5**), and patterns, relations, and functions (**Standard 7**), is clearly evident. Any entity involved in long-range professional development planning in the area of mathematics in high school must address these three critical areas of concern in order to build the capacity of ALL high school teachers to teach ALL high school students to high standards. Preservice, as well as ongoing professional development initiatives, should view these three areas of mathematics as priorities for focused, content-rich professional development. Partnerships between mathematics professors, mathematics education professors and Montana

districts must be developed in order to address these content issues in a timely fashion. District curriculum planning should involve thoughtful dialogue about appropriate scope and sequence with regard to these three standards regardless of textbook content. Additional materials and/or new teaching materials may be necessary when planning curriculum aligned to Montana's Student Content and Performance Standards. Statewide and district assessments should also be evaluated for their ability to assess the content and skills within these benchmarks. The benchmarks within these standards are of higher-order thinking skills, and may be difficult to assess with paper and pencil tests.

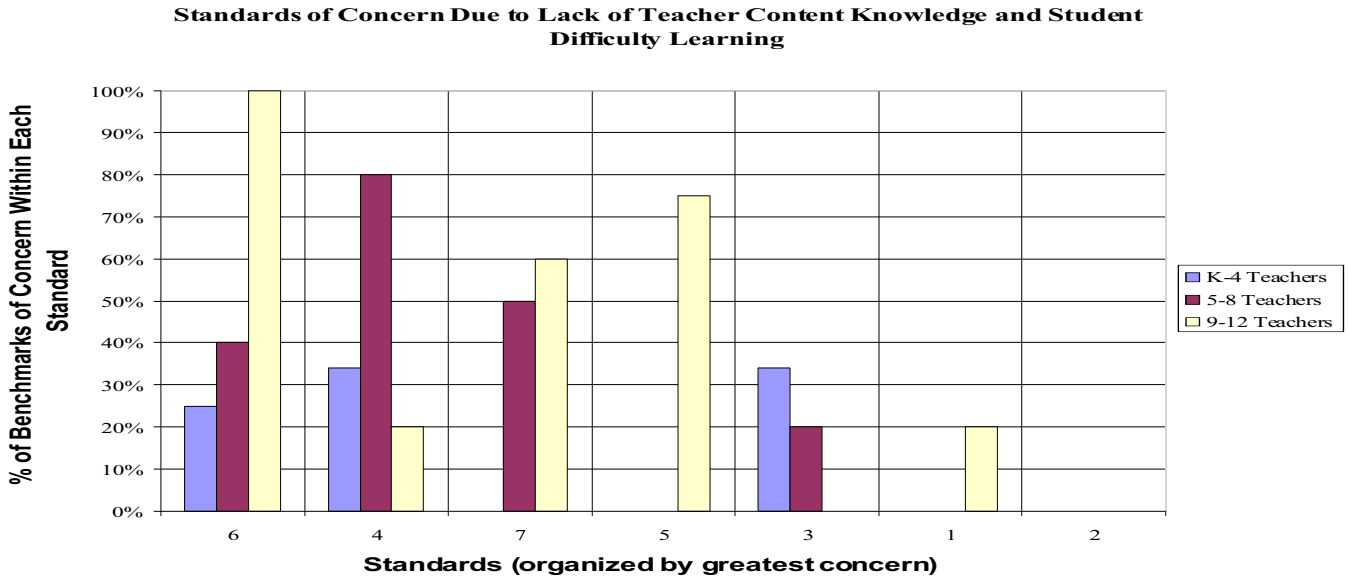
Although the same attention to scope, sequence, methodology, and assessment should take place around **Standard 1**, "Students engage in the mathematical process of problem solving and reasoning, estimation, communication, connections and applications, and using appropriate technology," intensive, short-term intervention-type professional development may be sufficient to build teaching capacity in problem solving. **Benchmarks 3.3**, **4.3**, and **4.4** should also be addressed through such professional development. Professional development venues such as MEA days, national and regional conferences, and summer institutes may provide adequate awareness and application-level professional development. Long-term, job-embedded support mechanisms such as peer coaching, study groups, and collaborative problem solving must precede any of these opportunities for teachers to successfully implement these strategies.

Integration of difficult Mathematics Standards into science, technology, and applied science classes will also prove to be beneficial to students who have a difficult time learning the content or skill. Real-world application of data analysis, statistics, proportions and measurements seem a natural fit for this type of integration. Cross-curricular teams of teachers working together to assist ALL students in the learning of these concepts and skills may go far in solving the problems of successful teaching of the Mathematics Standards.

First and foremost, however, is the need to address the lack of content comfort many high school teachers are experiencing as they attempt to implement Montana's newly revised Mathematics Standards. A teacher who does not have a high level of understanding of mathematics will only be able to teach the mechanics of mathematics and will not be able to help students synthesize their understanding of mathematics concepts.

Kindergarten – Grade 12 Mathematics Findings

- **Standard 6**, "Students demonstrate an understanding of and an ability to use data analysis, probability, and statistics" was reported as being of greatest concern to teachers of grades K-12.
- Teachers in all grade levels felt uncomfortable with their own content knowledge of at least one of the benchmarks, and many teachers are not teaching the benchmarks found in **Standard 6**.
- Another concern for teachers in all grade levels is **Standard 4**, "Students demonstrate an understanding of shape and an ability to use geometry."
- When teachers are teaching the benchmarks of concern in **Standards 6** and **4** they feel that even with instruction and practice, students have a difficult time learning the concepts and skills.



Recommendations for a Broad-Scale Professional Development Initiative

The need for a statewide, long-term effort to raise ALL teachers' content comfort in the area of **Standard 6**, data analysis, probability and statistics, and **Standard 4**, geometry, is clearly evident. There is also a need for a grades K-8 effort to increase content knowledge in the area of **Standard 3**, algebraic process. Also apparent is the need for increased content knowledge of grades 5-12 teachers in **Standard 7**, functions.

Any entity involved in long-range professional development planning in the area of mathematics must address these critical areas of concern in order to build the capacity of ALL teachers to teach ALL students to high standards. Preservice, as well as ongoing professional development initiatives, should be viewed as priorities for focused, content-rich professional development in the area of mathematics. Partnerships between mathematics professors, mathematics education professors and Montana districts must be developed in order to address these content issues in a timely fashion. District curriculum planning should involve thoughtful dialogue about appropriate scope and sequence with regard to these four standards regardless of textbook content. Additional materials and/or new teaching materials may be necessary when planning curriculum aligned to Montana's Student Content and Performance Standards. Statewide and district assessments should also be evaluated for their ability to assess the content and skills within these benchmarks. The benchmarks within these standards are of higher-order thinking skills, and may be difficult to assess with paper and pencil tests.

Recommendations for Conferences and Workshops

Although the same attention to scope, sequence, methodology, and assessment should take place around the benchmarks that teachers **DO** feel comfortable in content knowledge, intense, short-term professional development may adequately address new strategies for teaching these concepts and skills. Professional development venues such as MEA days, national and regional conferences, and summer institutes should provide such professional development. Long-term, job-embedded support mechanisms, such as peer coaching, study groups, and collaborative problem solving, must precede any of these opportunities for teachers to successfully implement these strategies.

Integration of difficult Mathematics Standards into science, technology, and applied science classes will prove to be beneficial to students who have a difficult time learning the content or skill. Real-world application of data analysis, statistics, geometry, and measurement seem a natural fit for this type of integration. Cross-curricular teams of teachers working together to assist ALL students in the learning of these concepts and skills may go far in solving the problems of successful teaching of Mathematics Standards.

Conclusion

First and foremost is the need to address the lack of content knowledge many Montana K-12 teachers are experiencing as they attempt to implement Montana's newly revised Mathematics Standards. For all of the benchmarks that teachers reported deficiencies in content knowledge, a greater number reported that they were either **NOT** teaching the benchmark or that even with instruction and practice, students were having a difficult time learning the benchmark. Most of the mathematics benchmarks of concern were directly related to higher-order thinking and understanding. Teachers who do **NOT** have a conceptual understanding of mathematics will teach the mechanics of mathematics and will not be able to teach students to synthesize their understanding of mathematics concepts.

Part 2 – Teacher Self-Assessment
Kindergarten – Grade 12 Reading

Response Options
Grades K-12 teachers surveyed were asked to respond in two ways to each benchmark within their grade-level reading content standards.

1. Teachers were asked to rank the comfort they felt with regard to their own content knowledge.
2. Teachers were asked to respond whether or not they introduced, taught, or reviewed the benchmark (reported as "**NOT** teaching"), and those who currently teach the benchmark were asked to report how difficult they felt the information was for students to learn.

Identification of Professional Development Priorities
In order to identify professional development priorities, the Montana State Reading Council Survey Analysis Subcommittee determined a level of concern for each response category. These levels of concern vary from category to category.

NOTE: The benchmarks in the tables do **NOT** represent **ALL** of the benchmarks. **ONLY** those that are of concern are listed. For a complete report of **All** response data go to the on-line report at http://www.metnet.state.mt.us.

Kindergarten – Grade 4 Reading Findings

The following table illustrates benchmarks that present a concern due to the number of teachers feeling uncomfortable with their content knowledge, teachers who are **NOT** teaching the benchmark **or if** teaching, say that even with instruction and practice, students are having a difficult time learning the identified concepts and skills.

Legend: Each benchmark of concern is labeled in the following table with one of two symbols.
● Indicates benchmarks that teachers feel **uncomfortable** with regard to content and report **NOT** teaching **or if** teaching, say students have a difficult time learning.
∞ Indicates benchmarks that teachers **DO** feel **comfortable** with regard to content, but report **NOT** teaching **or if** teaching, say students have a difficult time learning.

STANDARD 1: Students construct meaning as they comprehend, interpret, and respond to what they read.	**% Of Grades K-4 Teachers Uncomfortable With Their Content Knowledge**			**Over 10% Of Teachers Report NOT Teaching The Benchmark**					**Over 30% Of Teachers Teaching The Benchmark Say The Benchmark Is Difficult For Students To Learn**				
	Percentage			**Grades**					**Grades**				
	10-15	**16-20**	**>20**	**K**	**1**	**2**	**3**	**4**	**K**	**1**	**2**	**3**	**4**
1.4 demonstrate basic understanding of main ideas and some supporting details.				∞									

STANDARD 2: Students apply a range of skills and strategies to read.	% Of Grades K-4 Teachers Uncomfortable With Their Content Knowledge			Over 10% Of Teachers Report NOT Teaching The Benchmark					Over 30% Of Teachers Teaching The Benchmark Say The Benchmark Is Difficult For Students To Learn				
	Percentage			Grades					Grades				
	10-15	16-20	>20	K	1	2	3	4	K	1	2	3	4
2.1 decode unknown words combining the elements of phonics, grammatical structures, analysis of word parts, and context to understand reading material				∞					∞				
2.2 demonstrate understanding of literary elements (e.g., plot, character, setting, problem, solution).				∞					∞				
2.3 identify literary devices (e.g., figurative language and exaggeration).				∞	∞				∞	∞	∞		∞
2.4 use features and organization of fiction and nonfiction material to comprehend complex material (e.g., paragraphs, chapters, titles, indices, tables of contents, graphs, charts, visuals).				∞	∞				∞	∞	∞		
2.5 adjust fluency, rate, and style of reading to the purpose of the material with guidance.				∞	∞				∞		∞		
2.6 develop vocabulary through the use of context clues, analysis of word parts, auditory clues, and reference sources (e.g., dictionary, thesaurus, glossary).				∞	∞				∞				
2.7 identify and apply reading strategies, including decoding words, self-correcting, and rereading to comprehend.				∞					∞				
2.8 ask questions and check predictions prior to, during, and after reading.				∞									

STANDARD 3: Students set goals, monitor, and evaluate their progress in reading.	% Of Grades K-4 Teachers Uncomfortable With Their Content Knowledge			Over 10% Of Teachers Report NOT Teaching The Benchmark					Over 30% Of Teachers Teaching The Benchmark Say The Benchmark Is Difficult For Students To Learn				
	Percentage			Grades					Grades				
	10-15	16-20	>20	K	1	2	3	4	K	1	2	3	4
3.1 articulate strategies used to self-monitor reading progress and to overcome reading difficulties with guidance from the teacher	●			●	●				●	●	●	●	●
3.2 describe reading successes and set reading goals				∞	∞				∞	∞	∞	∞	
3.3 select authors, subjects, and print and non-print material to share with others.				∞	∞								

STANDARD 4: Students select, read, and respond to print and non-print materials for a variety of purposes.	% Of Grades K-4 Teachers Uncomfortable With Their Content Knowledge			Over 10% Of Teachers Report NOT Teaching The Benchmark					Over 30% Of Teachers Teaching The Benchmark Say The Benchmark Is Difficult For Students To Learn				
	Percentage			Grades					Grades				
	10-15	16-20	>20	K	1	2	3	4	K	1	2	3	4
4.1 identify a variety of purposes for reading (e.g., personal satisfaction, lifelong reading habits).				∞	∞								
4.2 solve a problem or answer question through reading (e.g., signs, labels, instruction).				∞									
4.3 perform tasks for a variety of purposes by reading (e.g., recipes, directions, schedules, maps, tables, charts).				∞									
4.4 read and provide oral, written, and/or artistic responses to diverse perspectives, cultures, and issues in traditional and contemporary literature.	●			●	●	●	●		●	●	●		
4.5 read a variety of sources to demonstrate an understanding of current events (e.g., newspapers, magazines).				∞	∞	∞			∞	∞	∞		
4.6 read and interpret information from a variety of documents and sources (e.g., memos, directories, maps, tables, schedules, etc.)				∞	∞	∞			∞	∞	∞		

STANDARD 5: Students gather, analyze, synthesize, and evaluate information from a variety of sources, and communicate their findings in ways appropriate for their purposes and audiences.	% Of Grades K-4 Teachers Uncomfortable With Their Content Knowledge			Over 10% Of Teachers Report NOT Teaching The Benchmark					Over 30% Of Teachers Teaching The Benchmark Say The Benchmark Is Difficult For Students To Learn				
	Percentage			Grades					Grades				
	10-15	16-20	>20	K	1	2	3	4	K	1	2	3	4
5.1 identify and summarize similarities and differences using a single element such as character within a text and between sources of information.				∞	∞				∞		∞		
5.2 make connections, integrate, and organize information from multiple sources.				∞	∞	∞			∞	∞	∞	∞	∞
5.3 recognize author's point of view.				∞	∞	∞			∞	∞	∞	∞	∞
5.4 distinguish fact from opinion in various print and non-print materials.				∞	∞				∞	∞			

Teacher Content Needs

In general, teachers of reading, grades K-4, felt comfortable about their own content knowledge with regard to Montana's Reading Content Standards; however the following benchmarks are of content concern:

- 11 percent of surveyed teachers reported **NOT** feeling comfortable with their own content knowledge in **Benchmarks 3.1** and **4.4**;
- 10 percent or more of grades K-1 teachers are currently **NOT** teaching **Benchmarks 3.1** and **4.4**;
- 30 percent or more of grades K-4 teachers reported it is difficult for students to learn **Benchmarks 3.1** and **4.4**;
- 10 percent or more of grades K-2 teachers are currently **NOT** teaching **Benchmark 4.4**; and
- 30 percent or more of grades K-2 teachers say it is difficult for students to learn **Benchmark 4.4**.

Grade Levels Currently NOT Being Taught The Benchmarks

Most reading teachers of students in grades 3 and 4 report teaching 100 percent of the benchmarks, however:

- 17 percent of teachers of reading in grade 2 report **NOT** teaching **Benchmarks 4.4, 4.5** and **4.6**;
- 14 percent of grade 2 teachers are also **NOT** teaching **Benchmark 5.2**; and
- 11 percent are **NOT** teaching **Benchmark 5.3**.

Although most teachers of reading in grades 2-4 are teaching most of the current benchmarks, most Kindergarten and many grade 1 teachers report that they do **NOT** introduce, teach, or review the concepts and skills found within the benchmark; and

- 17 percent of the grade 1 teachers surveyed report **NOT** teaching **Benchmark 2.3**;
- 29 percent are **NOT** teaching **Benchmark 2.4**;
- 14 percent are **NOT** teaching **Benchmark 2.5**;
- 11 percent are **NOT** teaching **Benchmark 2.6**;
- between 14 and 16 percent are **NOT** teaching any of the benchmarks found in **Standard 3**; and
- 26 percent are **NOT** teaching **Benchmarks 4.4**, **4.5**, and **4.6**.

Between 20 and 30 percent of Kindergarten and grade 1 teachers of reading surveyed are **NOT** teaching any of the benchmarks found in **Standard 5** and over **50 percent** reported **NOT** teaching **Benchmarks 2.2-2.6**, **3.1**, **4.5**, **4.6**, **5.2** and **5.3** with these five **EXCEPTIONS**:

1. **Benchmark 1.1** makes predictions and connections between new material and previous information/experiences;
2. **Benchmark 1.2** incorporates new print/non-print information into existing knowledge to draw conclusions and make application;
3. **Benchmark 1.3** provides oral, written, and/or artistic responses to ideas and feelings generated by the reading material;
4. **Benchmark 1.5** accurately retells key elements of appropriate reading material; and
5. 15 percent or more of all Kindergarten teachers surveyed responded that they do **NOT** introduce, teach, or review any of the other Reading Benchmarks.

Current Instructional Challenges

Of the teachers who **DO** teach the concepts found in the Reading Benchmarks, the greatest instructional challenges came from **Standards 5**, **3**, and **4** respectively; and

- 35 percent or more of grades K-4 teachers surveyed reported difficulty in student learning of **Benchmarks 5.2** and **5.3**;
- 30 percent or more of Kindergarten and grade 1 teachers who are currently teaching the benchmarks say students have a difficult time learning 100 percent of the benchmarks in **Standard 5**;
- 40 percent or more of grades K-4 teachers reported students have a difficult time learning **Benchmark 3.1** and 30 percent or more said that students have a difficult time learning **Benchmark 3.2**; and
- 30 percent or more of grades K-2 teachers reported that students have a difficult time learning **Benchmarks 4.4-4.6**.

Recommendations for Professional Development for Kindergarten – Grade 4 Reading

Teachers responding that they were uncomfortable in their own content knowledge of **Benchmarks 3.1, 3.2,** and **4.4** also reported that they were **NOT** teaching these benchmarks **or if** teaching, students had a difficult time learning the concept or skill. Thus, a concerted effort across educational associations and entities must be made around the content within **Standard 3.** All teachers of grades K-4 must understand what it means to have students set goals, monitor and evaluate their own progress in reading. In particular, professional development around strategies to self-monitor reading progress and overcome reading difficulties (**Benchmark 3.1**) must be made a part of all elementary education and district in-service programs. Professional development and preservice instruction should also focus on improved teacher understanding of oral, written, and/or artistic responses to diverse perspectives, cultures, and issues in traditional and contemporary literature (**Benchmark 4.4**). This benchmark lends itself to developing an appreciation for, and an acceptance of, other cultures. The wealth of contemporary and traditional literature from Montana Indian cultures lends itself well to the learning of this benchmark.

Researched instructional strategies aligned to the teaching of **Standard 4**, "Select, read and respond to print and non-print materials for a variety of purposes," and **Standard 5**, "Gather, analyze, synthesize and evaluate information" should be a focus for professional development for teachers of reading. Although this survey represents teachers of reading only, strategies for teaching these standards should be included in professional development across curricular areas as these skills are critical to understanding information in all content.

Any entity involved in planning curriculum scope and sequence must pay particular attention to aligning the content within the standards to instruction at the Kindergarten and grade 1 levels. Grades K-4 teams must interpret the evolution of student knowledge with regard to the standards beginning with Kindergarten. Although all of the benchmarks may not be appropriate to teach at all grade levels, teachers of Kindergarten and grade 1 must understand that they contribute to the learning of the concepts and skills.

Grades 5 – 8 Reading Findings

The following table illustrates benchmarks that present a concern due to the number of teachers feeling uncomfortable with their content knowledge and teachers who are **NOT** teaching the benchmark **or if** teaching, say that even with instruction and practice, students are having a difficult time learning the identified concepts and skills.

Legend: Each benchmark of concern is labeled in the following table with one of two symbols.
● Indicates benchmarks that teachers feel **uncomfortable** with regard to content and report **NOT** teaching **or if** teaching, say students have a difficult time learning.
∞ Indicates benchmarks that teachers **DO** feel **comfortable** with regard to content, but report **NOT** teaching **or if** teaching, say students have a difficult time learning.

STANDARD 1: Students construct meaning as they comprehend, interpret, and respond to what they read.	**% Of Grades 5-8 Teachers Uncomfortable With Their Content Knowledge**			**Over 10% Of Teachers Report NOT Teaching The Benchmark**				**Over 30% Of Teachers Teaching The Benchmark Say The Benchmark Is Difficult For Students To Learn**			
	Percentage			**Grades**				**Grades**			
	10-15	**16-20**	**>20**	**5**	**6**	**7**	**8**	**5**	**6**	**7**	**8**
1.3 interpret and provide oral, written, and/or artistic responses to ideas and feelings generated by the reading material and compare responses with peers.										∞	

STANDARD 2: Students apply a range of skills and strategies to read.	% Of Grades 5-8 Teachers Uncomfortable With Their Content Knowledge			Over 10% Of Teachers Report NOT Teaching The Benchmark				Over 30% Of Teachers Teaching The Benchmark Say The Benchmark Is Difficult For Students To Learn			
	Percentage			Grades				Grades			
	10-15	16-20	>20	5	6	7	8	5	6	7	8
2.3 identify and compare literary devices (e.g., figurative language, exaggeration, irony, humor, dialogue).								∞			∞
2.4 use features and organization of fiction and nonfiction material to comprehend complex materials (e.g., paragraphs, chapters, titles, indices, tables of contents, graphs, charts, visuals).											∞
2.5 adjust fluency, rate, and style of reading to the content and purpose of the material.						∞				∞	
2.6 develop vocabulary through the use of context clues, analysis of word parts, auditory clues, and reference sources, and construct general and specialized vocabularies related to specific academic areas, culture, and technology.										∞	
2.7 use a variety of reading strategies to comprehend meaning, including self-correcting, re-reading, using context, and adjusting rate.											∞
2.8 ask questions, check predictions, and summarize information prior to, during, and after reading.										∞	

STANDARD 3: Students set goals, monitor, and evaluate their progress in reading.	**% Of Grades 5-8 Teachers Uncomfortable With Their Content Knowledge**			**Over 10% Of Teachers Report NOT Teaching The Benchmark**				**Over 30% Of Teachers Teaching The Benchmark Say The Benchmark Is Difficult For Students To Learn**			
	Percentage			**Grades**				**Grades**			
	10-15	**16-20**	**>20**	**5**	**6**	**7**	**8**	**5**	**6**	**7**	**8**
3.1 articulate and evaluate strategies to self-monitor reading progress, overcome reading difficulties, and seek guidance as needed.								∞	∞	∞	∞
3.2 monitor reading successes and set reading goals.		●				●		●	●	●	●
3.3 select authors, subjects, and print and non-print material, expressing reasons for recommendations.	●					●				●	

STANDARD 4: Students select, read, and respond to print and non-print materials for a variety of purposes.	**% Of Grades 5-8 Teachers Uncomfortable With Their Content Knowledge**			**Over 10% Of Teachers Report NOT Teaching The Benchmark**				**Over 30% Of Teachers Teaching The Benchmark Say The Benchmark Is Difficult For Students To Learn**			
	Percentage			**Grades**				**Grades**			
	10-15	**16-20**	**>20**	**5**	**6**	**7**	**8**	**5**	**6**	**7**	**8**
4.2 read to organize and understand information, and to use material to investigate a topic (e.g., reference material, manuals, public documents, newspapers, magazines and electronic information).										∞	
4.3 read, interpret, and apply information to perform tasks (e.g., maps, travel books, first aid manuals, catalogs).		●								●	
4.4 read, analyze, and provide oral, written, and/or artistic responses to traditional and contemporary literature.	●					●				●	●
4.5 identify recurring themes, perspectives, cultures, issues by reading (e.g., identity, conflict, change).	●							●		●	
4.6 read, and identify civic and social responsibilities by interpreting and analyzing social rules (e.g., handbooks, newspapers, other information).	●					●		●		●	

STANDARD 5: Students gather, analyze, synthesize, and evaluate information from a variety of sources, and communicate their findings in ways appropriate for their purposes and audiences.	% Of Grades 5-8 Teachers Uncomfortable With Their Content Knowledge			Over 10% Of Teachers Report NOT Teaching The Benchmark				Over 30% Of Teachers Teaching The Benchmark Say The Benchmark Is Difficult For Students To Learn			
	Percentage			Grades				Grades			
	10-15	16-20	>20	5	6	7	8	5	6	7	8
5.1 compare and contrast information and textual elements in print and non-print material.			●			●				●	
5.2 make connections, explain relationships among a variety of sources, and integrate similar information.			●	●				●		●	●
5.3 recognize authors' points of view and purposes.			●								●
5.4 recognize, express, and defend a point of view.		●						●	●		●
5.5 recognize, express, and defend a point of view.								∞		∞	

Needs Related to Teacher Content Knowledge

- Grades 5-8 teachers of reading had the greatest number of concerns with regard to their own content knowledge of the benchmark concepts and skills within the Reading Standards.
- Like grades K-4 teachers, grades 5-8 teachers were concerned with their understanding of **Standard 3**.
- 17 percent of the surveyed teachers reported **NOT** feeling comfortable with the concept of monitoring reading success and setting reading goals (**Benchmark 3.2**).
- Grades 5-8 teachers also reported feeling uncomfortable with benchmarks in **Standard 4** "Students select, read, and respond to print and non-print materials for a variety of purposes," and **Standard 5** "Students gather, analyze, synthesize, and evaluate information from a variety of sources, and communicate their findings in ways appropriate for their purposes and audiences."
- 10 percent were uncomfortable with all the **Standard 4 Benchmarks**, except **4.2**.
- 20 percent or more of grades 5-8 teachers reported being uncomfortable with their content knowledge of **Benchmarks 5.1, 5.2,** and **5.4**.
- 33 percent were uncomfortable with **Benchmark 5.3**.

Grade Levels Currently NOT Being Taught The Benchmarks

- 90 percent or more of grades 5, 6 and 8 teachers reported teaching ALL of the reading benchmarks with the exception of **Benchmark 5.2**.
- 11 percent of grade 5 teachers are **NOT** teaching **Benchmark 5.2**.
- 10 percent or more of grade 7 teachers reported not teaching **Benchmarks 2.5, 4.4, 4.6, 3.2, 3.3, 5.1,** and **5.3**.

Current Instructional Challenges

Standard 2, "Students apply a range of skills and strategies to read," is of concern for teachers of reading in grades 7 and 8. Over 30 percent of either grade 7 or 8 teachers reported 100 percent of the benchmarks in **Standard 2** were difficult to learn, with the exception of student's ability to understand literary elements such as plot or character (**Benchmark 2.2**).

Standard 3, "Students set goals, monitor, and evaluate their progress in reading," was reported as having two of the three benchmarks pose challenges to over 30 percent of responding teachers at grade levels 5-8.

Standard 4 presents instructional challenges, particularly reported by teachers of reading in grades 5 and 7.

- Teachers reported that students at these grade levels have difficulty reading sources to demonstrate understanding current events (**Benchmark 4.5**), and identifying social and civic responsibilities by interpreting and analyzing social rules (**Benchmark 4.6**).
- Over 30 percent of grade 7 teachers stated that students have a difficult time reading signs, labels, and instructions in order to perform tasks and solve problems (**Benchmarks 4.2, 4.3**), and providing oral, written and/or artistic responses to diverse perspectives and cultures (**Benchmark 4.4**).

Standard 5 presents a number of instructional challenges to teachers of grades 5-8.

- Over 30 percent of grades 5-8 teachers of reading surveyed reported students have a difficult time learning to make connections, integrate, and organize information (**Benchmark 5.2**).
- Over 30 percent of grades 5 and 7 teachers reported students have difficulty learning to identify and summarize similarities and differences using a single element such as character (**Benchmark 5.1**).
- Over 30 percent of all grades 5, 6, and 8 teachers reported students have difficulty distinguishing fact from opinion (**Benchmark 5.4**).

Recommendations for Grades 5 – 8 Reading

Three standards stand out as clear priorities for content-rich professional development:

- **Standard 5**, "Students gather, analyze, synthesize, and evaluate information from a variety of sources, and communicate their findings in ways appropriate for their purposes and audiences."
- **Standard 4**, "Students select, read, and respond to print and non-print material for a variety of purposes."
- **Standard 3**, "Students set goals, monitor, and evaluate their progress in reading," particularly **Benchmark 3.2**, describe reading successes and set reading goals and **Benchmark 3.3**, select authors, subjects, and print and non-print material to share with others.

It is important to note that each benchmark that was reported as a concern to teachers because of a lack of content knowledge, was reported by an even greater number of teachers as difficult for students to learn. Because of this consistent finding, the content found in **Standards 3, 4,** and **5** should be the focal point for a long-term, content-rich middle school professional development initiative. These three critical areas of concern must be addressed by all those involved in professional development in order to build the capacity of ALL middle grade teachers to teach ALL areas of reading.

Partnerships between reading professors and reading education professors, and Montana districts and professional organizations must be developed in order to address these content issues in a timely fashion.

Integration of reading skills and strategies should be an essential component of professional development for all middle grade teachers. The middle grade teachers should be equipped to assist students in making real-world application of the reading skills and strategies utilized in conjunction with instruction and assessment.

Integration of content and skills found within **Standard 4** and **5** into all content areas will improve the students' ability to learn these standards. **Benchmarks 4.2-4.7, 5.2, 5.4,** and **5.5** are critical skills for the understanding and synthesis of knowledge within any content area. Cross-curricular teams, especially in middle schools, must collaborate to monitor and assess these reading skills.

Professional development and preservice instruction should also focus on improved teacher understanding of oral, written, and/or artistic responses to diverse perspectives, cultures, and issues in traditional and contemporary literature (**Benchmark 4.4**). This benchmark lends itself to developing an appreciation for and an acceptance of other cultures. The wealth of contemporary and traditional literature from Montana Indian cultures lends itself well to the learning of this benchmark.

District curriculum planning should involve thoughtful dialogue about appropriate scope and sequence with regard to these standards, especially in grade 7, regardless of textbook content. Additional materials and/or new teaching materials may be necessary when planning curriculum aligned to Montana's Student Content and Performance Standards.

Statewide and district assessments should also be evaluated for their ability to assess the content and skills within these benchmarks. The benchmarks within these standards are of higher-order thinking skills and may be difficult to assess with paper and pencil tests.

Grades 9 – 12 Findings

The following table illustrates benchmarks that present a concern due to the number of teachers feeling uncomfortable with content and the number of teachers who are either **NOT** teaching the benchmark **or if** teaching, say that even with instruction and practice, students are having a difficult time learning the concepts and skills.

NOTE: Responses of grades 9-12 teachers of reading courses open to ALL students are represented in the table below. Thirty-nine teachers reported teaching courses open to ALL students. See Appendix H for responses including teachers of Title I and Advanced Reading courses.

Legend: Each benchmark of concern is labeled in the following table with one of two symbols.
● Indicates benchmarks that teachers feel **uncomfortable** with regard to content and report **NOT** teaching **or if** teaching, say students have a difficult time learning.
∞ Indicates benchmarks that teachers **DO** feel **comfortable** with regard to content, but report **NOT** teaching **or if** teaching, say students have a difficult time learning.

STANDARD 1: Students construct meaning as they comprehend, interpret, and respond to what they read.	**% Of Grades 9-12 Teachers Teaching Classes Open To ALL Students Uncomfortable With Their Content Knowledge**			**% Of Teachers Who Do NOT Teach The Benchmarks In Classes Open to ALL Students**				**% Of Teachers Teaching ALL Students Who Say Students Have A Difficult Time Learning The Benchmark**			
	Percentage			**% NOT Currently Teaching**				**% Responding as Above**			
	10-15	**16-20**	**>20**	**10-25**	**26-35**	**36-45**	**>45**	**10-25**	**26-35**	**36-45**	**>45**
1.1 make predictions and describe inferences and connections within material and between new material and previous information/experiences.	●						●	●			
1.2 integrate new important print/non-print information with their existing knowledge to draw conclusions and make application							∞	∞			
1.3 provide oral, written, and/or artistic responses to ideas and feelings generated by the reading material, providing examples of the way these influence one's life and role in society.	●						●	●			
1.4 demonstrate understanding of main ideas and formulate arguments using supporting evidence.	●						●	●			
1.5 accurately paraphrase reading material, reflecting tone and point of view.	●						●	●			

STANDARD 2: Students apply a range of skills and strategies to read.	% Of Grades 9-12 Teachers Teaching Classes Open To ALL Students Uncomfortable With Their Content Knowledge			% Of Teachers Who Do NOT Teach The Benchmarks In Classes Open to ALL Students				% Of Teachers Teaching ALL Students Who Say Students Have A Difficult Time Learning The Benchmark			
	Percentage			% NOT Currently Teaching				% Responding as Above			
	10-15	16-20	>20	10-25	26-35	36-45	>45	10-25	26-35	36-45	>45
2.1 decode unknown words combining the elements of phonics, grammatical structures, analysis of word parts, word connotation, and denotation of context to understand reading material.	●						●			●	
2.2 identify, analyze, and evaluate literary elements (e.g., plot, character, theme, setting, point of view, conflict).							∞	∞			
2.3 identify, analyze, and evaluate the use of literary devices (e.g., figurative language, exaggeration, irony, humor, dialogue, satire, symbolism).							∞		∞		
2.4 use features and organization of fiction and nonfiction materials to comprehend increasingly complex material (e.g., paragraphs, chapters, titles, indices, tables of contents, graphs, charts, visuals, and methods of organization).							∞	∞			
2.5 adjust fluency, rate, and style of reading to content and purpose of the material.	●						●		●		
2.6 develop vocabulary through the use of context clues, analysis of word parts, auditory clues, and reference sources, and expand and refine vocabulary related to specific academic areas, culture, and technology.							∞		∞		
2.7 use a variety of reading strategies to comprehend complex material, including self-correcting, rereading, using context, and adjusting rate.							∞		∞		
2.8 ask questions, check predictions, summarize, and reflect on information to monitor progress while taking responsibility for directing one's own reading.	●						●		●		

STANDARD 3: Students set goals, monitor, and evaluate their progress in reading.	**% Of Grades 9-12 Teachers Teaching Classes Open To ALL Students Uncomfortable With Their Content Knowledge**			**% Of Teachers Who Do NOT Teach The Benchmarks In Classes Open to ALL Students**				**% Of Teachers Teaching ALL Students Who Say Students Have A Difficult Time Learning The Benchmark**			
	Percentage			**% NOT Currently Teaching**				**% Responding as Above**			
	10-15	**16-20**	**>20**	**10-25**	**26-35**	**36-45**	**>45**	**10-25**	**26-35**	**36-45**	**>45**
3.1 articulate and evaluate strategies to solve reading problems, self-monitor progress, and direct one's own reading.	●						●			●	
3.2 analyze reading successes and attainment of reading goals.	●						●	●			
3.3 select authors, subjects, and print and non-print material, expressing reasons for recommendations, and information and insights gained.	●						●	●			

STANDARD 4: Students select, read, and respond to print and non-print materials for a variety of purposes.	% Of Grades 9-12 Teachers Teaching Classes Open To ALL Students Uncomfortable With Their Content Knowledge			% Of Teachers Who Do NOT Teach The Benchmarks In Classes Open to ALL Students				% Of Teachers Teaching ALL Students Who Say Students Have A Difficult Time Learning The Benchmark			
	Percentage			% NOT Currently Teaching				% Responding as Above			
	10-15	16-20	>20	10-25	26-35	36-45	>45	10-25	26-35	36-45	>45
4.1 integrate purposes for reading into daily life (e.g., personal satisfaction, lifelong reading habits, reading as a leisure activity, sharing, and reflecting upon the reading).							∞		∞		
4.2 read to evaluate appropriate resource material for a specific task.							∞		∞		
4.3 locate, read, analyze, and interpret material to investigate a question, topic, or issue (e.g., reference material, pamphlets, book excerpts, articles, letters, and electronic information).							∞	∞			
4.4 read, analyze, and synthesize information to perform complex tasks for a variety of purposes (e.g., schedules, maps, instructions, consumer reports, and technical manuals).		●					●				●
4.5 read and analyze works of various authors (e.g., diverse cultures, perspective and issues, recurring themes).							∞	∞			
4.6 read, evaluate, and create material and documents related to social and civic responsibilities (e.g., letters to the editor, posters).	●						●	●			
4.7 locate, read, analyze, and evaluate information from a variety of sources (e.g., manuals, instructions, flowcharts, television, Internet).							∞	∞			

STANDARD 5: Students gather, analyze, synthesize, and evaluate information from a variety of sources, and communicate their findings in ways appropriate for their purposes and audiences.	% Of Grades 9-12 Teachers Teaching Classes Open To ALL Students Uncomfortable With Their Content Knowledge			% Of Teachers Who Do NOT Teach The Benchmarks In Classes Open to ALL Students				% Of Teachers Teaching ALL Students Who Say Students Have A Difficult Time Learning The Benchmark			
	Percentage			% NOT Currently Teaching				% Responding as Above			
	10-15	16-20	>20	10-25	26-35	36-45	>45	10-25	26-35	36-45	>45
5.1 compare and contrast information and broad themes within and among a variety of information sources.							∞	∞			
5.2 logically synthesize information from a complex range of print and non-print sources							∞		∞		
5.3 apply basic principles of formal logic to print and non-print sources	●						●			●	
5.4 analyze use of evidence, logic, language devices, and bias as strategies to influence readers.	●						●		●		

Teacher Content Needs

Of the teachers of reading grades K-12, grades 9-12 teachers had the greatest concerns about their own knowledge of the content and skills found in the standards. Content concerns were identified in each of the five standards. The following lists the standards in order of **greatest** content concern for grades 9-12 teachers.

1. **Standard 3**, "Students set goals, monitor, and evaluate their progress in reading."
2. **Standard 2**,"Students apply a range of skills and strategies to read."
3. **Standard 5**, "Students gather, analyze, synthesize, and evaluate information from a variety of sources, and communicate their findings in ways appropriate for their purposes and audiences."
4. **Standard 1**, "Students construct meaning as they comprehend, interpret, and respond to what they read."
5. **Standard 4**,"Students select, read, and respond to print and non-print materials for a variety of purposes."

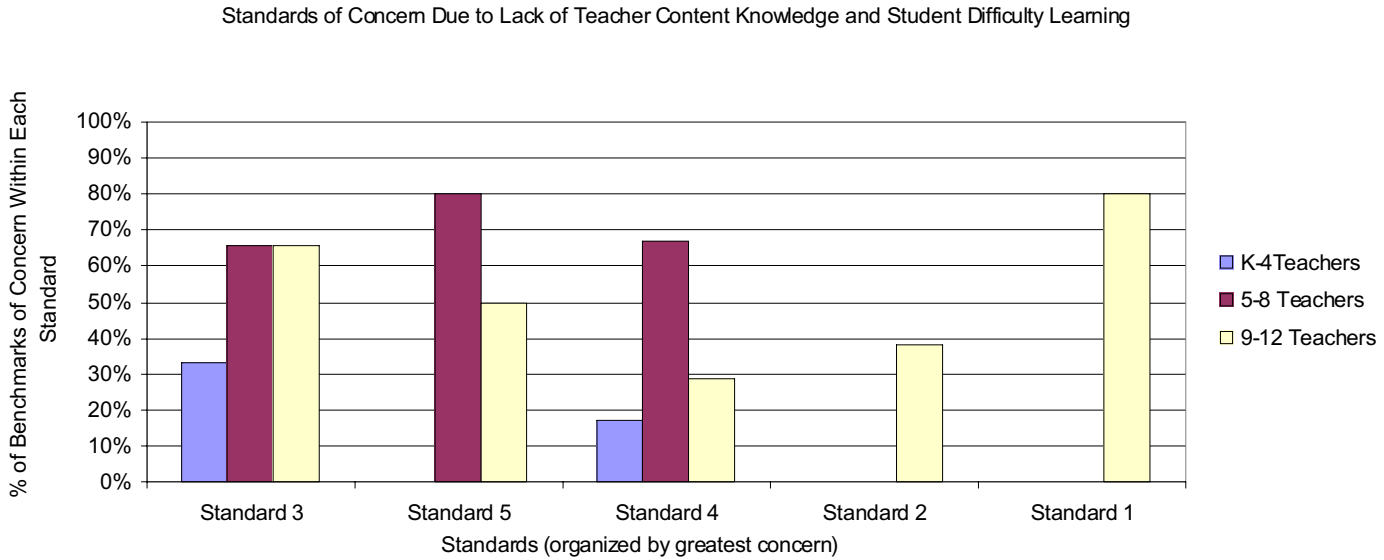
Over **50 percent** of All survey respondents reported **NOT** teaching **100 percent** of the Reading Benchmarks."

Recommendations for Grades 9 – 12 Reading

The topic of teaching reading at the high school level must be addressed. Who teaches reading content and skills as students enter the final years of their formal education and how these skills are to be taught should be a part of all district and state discussions concerning the implementation of the Reading Standards. If it is believed that ALL teachers are teachers of reading, then professional development for **ALL** high school teachers in the content of the standards and proven practices in teaching reading to older students must occur. Implementation of these standards is seen as the greatest challenge at the high school level because of the number of teachers who are not comfortable with their own content, and the alarmingly high percentage of teachers who are **NOT** teaching grades 9-12 Reading Standards.

Kindergarten – Grade 12 Reading Findings

- **Reading Content Standard 3**, "Students set goals, monitor, and evaluate their progress in reading," was reported as being of greatest concern to teachers of grades K-12.
- Teachers in all grade levels felt uncomfortable with their own content knowledge of at least one of the benchmarks, and many teachers are not teaching the benchmarks found in **Standard 4**, "Students select, read, and respond to print and non-print material for a variety of purposes."
- When teachers are teaching the benchmarks of concern in **Standards 3** and **4** they feel that even with instruction and practice, students have a difficult time learning the concepts and skills.
- **Standard 5,** "Students gather, analyze, synthesize, and evaluate information from a variety of sources, and communicate their findings in ways appropriate for their purposes and audiences," is of great content concern to teachers of reading grades 5-12.
- Teachers of grades 9-12 report feeling uncomfortable with many of the benchmarks found within all of the standards.



Recommendations for Kindergarten – Grade 12 Reading

The survey data strongly indicates the need for a content-rich, statewide, long-term, sustained effort to increase grades K-12 teacher knowledge of two of the Reading Content Standards: **Standard 3**, "Students set goals, monitor, and evaluate their progress in reading," and **Standard 4**, "Students select, read, and respond to print and non-print material for a variety of purposes."

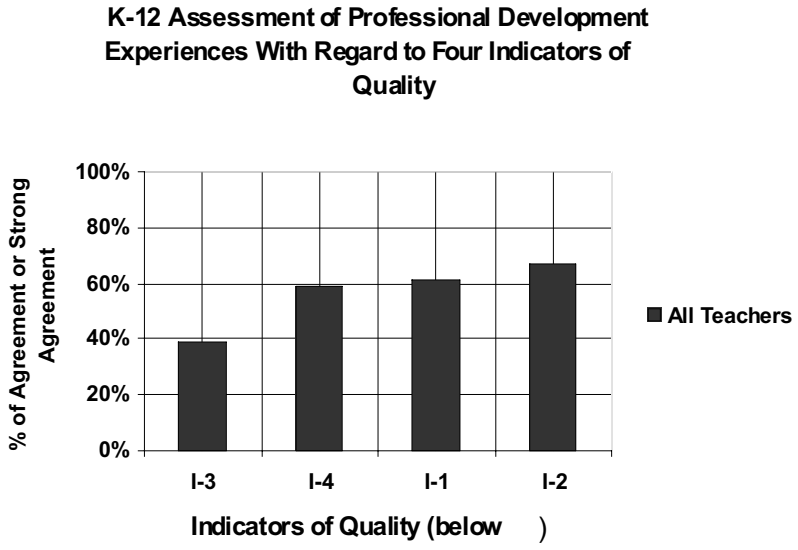
Other needs for focused professional development

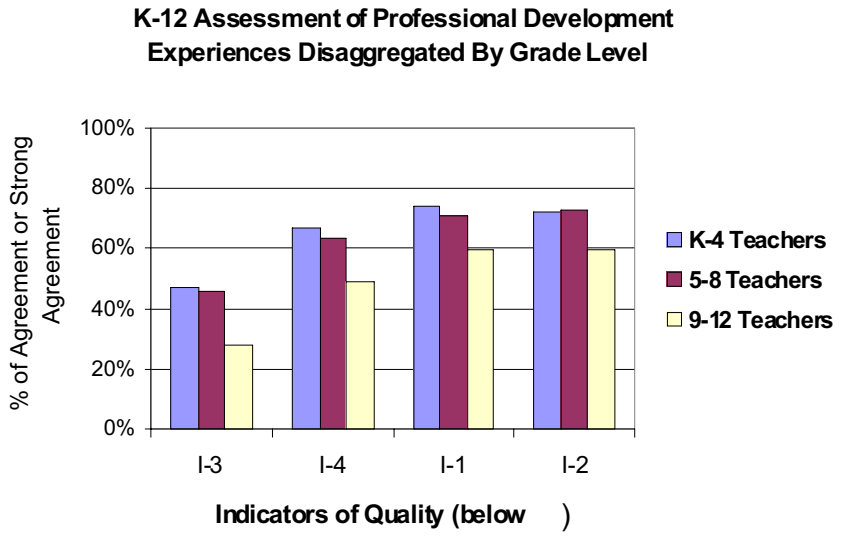
- Content-rich professional development for middle grade teachers concerning **Standard 5**, "Students gather, analyze, synthesize, and evaluate information from a variety of sources, and communicate their findings in ways appropriate for their purposes and audiences."
- Awareness building activities for Kindergarten and grade 1 teachers concerning their contribution to teaching the benchmarks and skills found in the reading standards.
- Professional development around implementation and content of all of the Reading Standards for teachers grades 9-12.

Any entity involved in long-range professional development planning for reading instruction must address the identified critical areas of concern in order to build the capacity of all teachers to teach ALL students to high standards. Pre-service, as well as on-going professional development initiatives, should view these areas of reading as priorities for focused, content-rich professional development. Partnerships between reading professors, content-area education professors, Montana districts and professional organizations must be developed to address these issues in a timely fashion. District curriculum planning should involve thoughtful dialogue about appropriate scope and sequence with regard to these identified standards and benchmarks. Additional materials and/or new teaching materials may be necessary when planning district curriculum aligned to Montana's Student Content and Performance Standards. Statewide and district assessments should also be evaluated for their ability to assess the content and skills within these benchmarks. The benchmarks within these standards are of higher-order thinking skills and may need to be tested and evaluated using a variety of performance assessment tools.

Part 3 – Professional Development Quality
Teachers of Kindergarten – Grade 12 Mathematics and Reading

Indicators of Quality





The four Indicators of Quality used for survey purposes are:

I-1) Professional Development focusing on individual, collegial and organizational improvement.
I-2) Professional Development focusing on high standards and reflecting best research in teaching and learning.
I-3) Professional Development supporting the implementation of new teaching strategies through on-going, collaborative professional development activities.
I-4) Professional Development is determined through a data collection and analysis process.

In order to evaluate current professional development with regard to the above indicators, survey participants were asked to respond to 15 statements aligned to the four Indicators of Quality listed above. Teachers responded in agreement or disagreement to three or four statements reflecting each of the Indicators of Quality (see Appendix F).

The following graph shows the percentage of the 2,047 survey participants who agreed with each statement.

Grades Kindergarten – Grade 12 Teacher Perceptions of Professional Development Aligned to Indicators of Quality Organized by Current Professional Development System Strengths and Weaknesses

(15) I reflect on and utilize my own student achievement data to plan instructional strategies.

(14) My PD activities encourage teachers to be active, investigative, reflective, practitioners.

(13) My PD activities focus on individual, collegial, and organizational improvement.

(12) My PD focuses on teachers as central to student learning yet includes all members of the school community.

(11) My PD enables teachers to develop further experiences in subject content, teaching strategies, uses of technology…in teaching to high standards.

(10) My PD is viewed as an essential component for achieving the goals of my school and is valued as an integral part of the school.

(9) **My PD reflects best available research and practice in teaching, learning, and leadership**

(8) Student achievement indicates that my staff development activities have lead to increased student learning.

(7) My PD results in permanent changes in my classroom practice.

(6) Staff development decisions are based on data regarding positive student achievement outcomes.

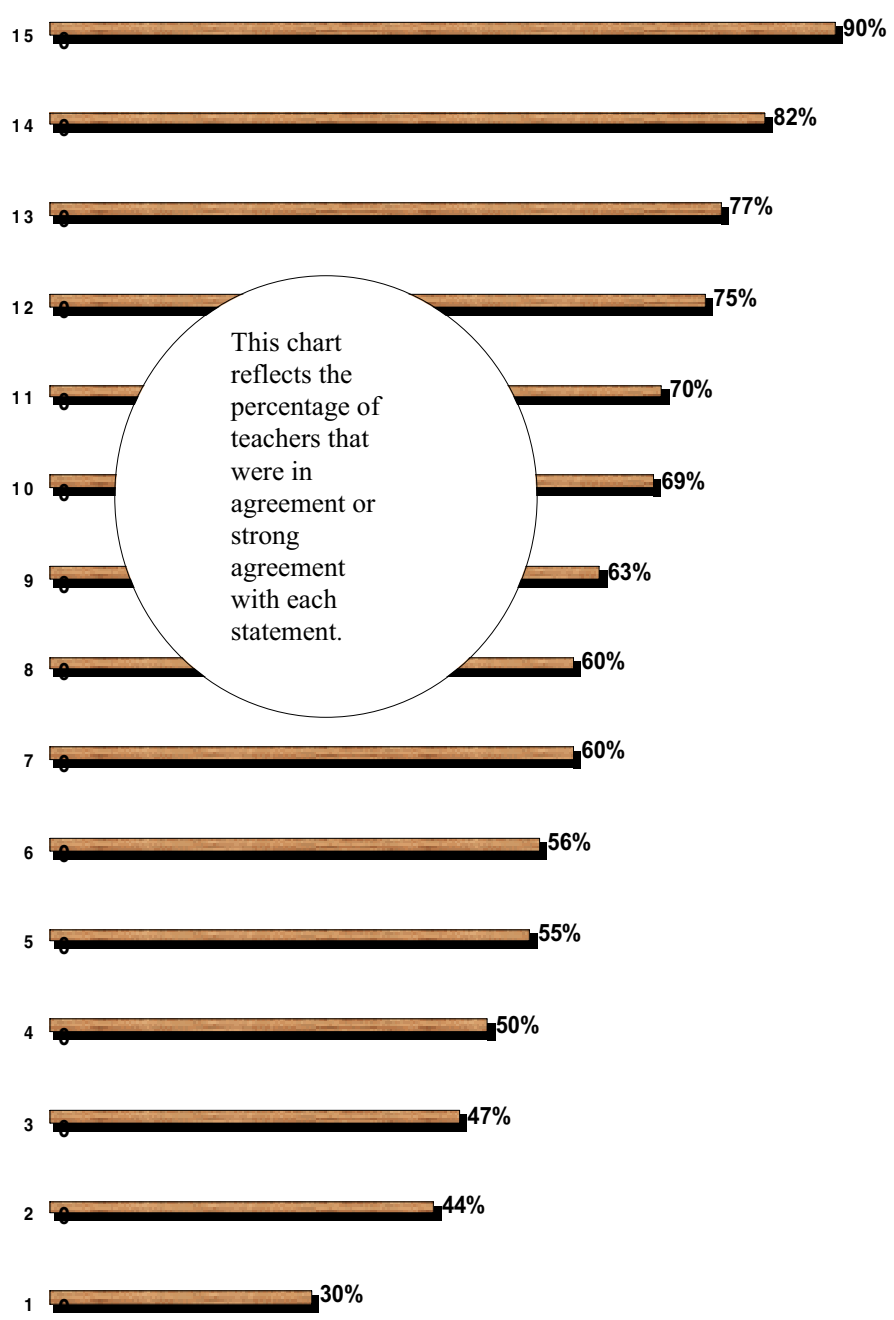
(5) Reading, studying and discussing student needs and the best strategies to meet those needs precedes decisions concerning staff development.

(4) My PD includes follow-up activities that allow me to reflect upon the impact of a new strategy on student achievement.

(3) My PD activities support me during the implementation through the institutionalization of a new teaching strategy.

(2) I am involved in collaborative planning on a weekly basis.

(1) Teachers are organized into support teams during the implementation of new content and/or teaching strategy.



Overall Findings

Professional Development System Strengths

The statements most teachers of reading and mathematics agreed or strongly agreed to **most often** were descriptors of professional development that focus on high standards and reflect best research in teaching and learning (Indicator 2).

- 82 percent of all teachers surveyed agreed or strongly agreed that their own professional development activities encouraged teachers to be active, investigative and reflective practitioners.
- 70 percent agreed that their professional development experiences in subject content, teaching strategies and uses of technology helped them develop the skills necessary for teaching to high standards.

Teachers also **often agreed** to the statements that indicated that professional development supports overall improvement (Indicator 1).

- 77 percent agreed that their professional development focuses on individual, collegial and organizational improvement.
- 75 percent agreed that professional development focuses on teachers as central to student learning yet includes all members of the school community.

Professional Development System Weaknesses

The statements most teachers of reading and mathematics agreed or strongly agreed to the **least often,** were descriptors of professional development that support the implementation of new teaching strategies through ongoing, collaborative professional development (Indicator 3).

- 47 percent agreed that their professional development supports them during implementation into institutionalization of new content and teaching strategies.
- 44 percent agreed that they are involved in collaborative planning on a weekly basis.
- 30 percent agreed that they were organized into support teams during the implementation of new content and/or teaching strategies.

Grade Level Differences

- Although the ranking of categories by agreement is the same for all three grade levels (K-4, 5-8, 9-12), over 10 percent fewer high school teachers agreed or strongly agreed in any category.
- In the descriptors of professional development focused on individual, collegial and organizational improvement (the highest of all the overall categories) only 59 percent of the high school teachers were in agreement.
- In the descriptors of professional development that supports the implementation of new teaching strategies, only 28 percent of the high school teachers were in agreement (see graph on page 41).

Recommendations – Overall Findings

In all professional development planning, an effort must be made to continue to provide quality delivery of new content and strategies aligned to individual, collegial and organizational improvement. Current policies and practices that have supported such professional development must be maintained as the state and districts reform their professional development systems. As the state, districts and associations work to improve Montana's professional development system, the addition of time and funding allocated for collaborative, on-going activities following any out-of-building professional development is necessary for ALL teachers to implement new content and teaching strategies into their classroom. All staff, school board members, parents and the community must be made aware of the need to support teachers as they implement new standards and new

practices. State and local policies and funding decisions must be made to support ongoing, job-embedded professional development if ALL students are to be proficient in ALL standards.

These recommendations imply that professional development is the ongoing development of teacher content knowledge and teaching skills. Staff development cannot be confined to a few specific days in the school calendar, but must be viewed as a process that is based on the continuous evaluation of teaching strategies and content knowledge. High-quality delivery of professional development content appears to be the norm throughout Montana. The addition of collaborative follow-up activities for teachers following conferences and workshops will build upon that strength and thereby increase the effectiveness of the professional development system.

1999 Montana ESEA Title II Eisenhower Study

Appendicies

APPENDIX A

Montana's Eisenhower Professional Development Program

Overarching Goal

Building the capacity of Montana's Professional Development Program to provide sustainable change in teaching practices through ongoing, job-imbedded professional development that leads to ALL students meeting high state student content and performance standards.

State Eisenhower Objectives

- Determination of high-quality professional development activities will be aligned to findings from the analysis of at least three sources of data to include two sources of disaggregated student performance data and one quantitative study to assess specific instructional needs.

- Professional development will be provided to address the needs of:
    1. Teachers in schools receiving Part A of Title I assistance; and
    2. Teachers teaching students who are identified as disadvantaged or otherwise at-risk of not attaining proficiency of Montana's Content and Student Performance Standards.

- Professional development programs will specifically address student achievement improvement objectives and teacher needs indicated in data findings.

- High-quality professional development is aligned to Montana's Content and Student Performance Standards and Researched Instructional Methods.

- Each Eisenhower program will provide job-embedded professional development that is sustained, ongoing and contributes to improvements in student achievement.

APPENDIX B

School Staffing & Teacher Characteristics

To meet the accreditation standards, certified teachers must be endorsed in the subjects they are assigned to teach, and librarians, guidance counselors, and administrators must have the proper endorsements. For example, a teacher certified to teach in an elementary self-contained classroom may not be assigned to teach math at the high school level without specific certification and endorsement. Nor may a science teacher be assigned to teach English without an endorsement. Schools or districts with staff who are assigned to teach in areas outside their certification or endorsement areas are cited in the accreditation reports.

TABLE 7-3: Teaching Assignment by Subject Area and Program Level, Full-time Equivalent (FTE), 1996-97

FULL-TIME EQUIVALENT STAFF					
Teaching Assignment	**Elementary**	**Middle/7-8**	**High School**	**Total**	**% of Total**
Elementary self-contained classroom	3,863	---	---	3863	37.6%
English	26	316	506	848	8.2%
Special Education	394	148	193	735	7.2%
Math	1 0	243	415	668	6.5%
Science	8	237	382	627	6.1%
Social Studies	1 0	234	345	589	5.7%
Health Enhancement	170	171	234	575	5.6%
Music	180	117	97	394	3.8%
Title I	227	60	64	351	3.4%
Applied Technology	---	62	190	252	2.5%
Art	38	88	121	247	2.4%
Other Vocational Education	---	60	172	232	2.3%
Business & related	2	24	186	212	2.1%
Foreign Languages		43	150	201	2.0%
Computer Education	9	38	68	115	1.1%
Gifted and Talented	29	15	5	49	0.5%
Other areas	8	147	166	321	3.0%
Total	**4,982**	**2003**	**3,294**	**10,279**	**100.0%**
Percent of total	**48.5%**	**19.5%**	**32.0%**	**---**	**100%**

Source: Montana Statewide Education Profile, Published by the Office of Public Instruction in April 1999

APPENDIX C

1999 ESEA TITLE II EISENHOWER
DATA DRIVEN DECISION MAKING STATEGIES

PARTICIPATING DISTRICTS TEACHER SURVEY

ABSAROKEE
ALBERTON
BIGFORK
BILLINGS
BILLINGS (Elder Grove)
BOZEMAN
CHARLO
CIRCLE
COLUMBIA FALLS
CORVALLIS
DARBY
DEER LODGE
DILLON
DRUMMOND
EKALAKA
EUREKA
GLENDIVE
GRASS RANGE
GREAT FALLS
HARDIN
HARLOWTON
HAVRE
HELENA
HUNTLEY PROJECT
KALISPELL
KALISPELL (West Valley)
LEWISTOWN
LINCOLN
LOLO
MILES CITY
MISSOULA HELLGATE
MOORE
PLENTYWOOD
PLEVNA
POPLAR
RED LODGE
ROUNDUP
ROY
SACO
SIMMS
TERRY
TROUT CREEK
TROY
VAUGHN
WHITEFISH
WINIFRED
WOLF POINT
WOLF POINT (Frontier Elementary)

APPENDIX D

APPENDIX E

APPENDIX F

Eisenhower ESEA Title II
Teacher Self-Assessment and Professional Development Survey

Details for Reading Data and Findings

NOTE: The bolded number in parenthesis indicates weight of response within the indicator category.

Survey Questions Regarding Each HQPD Indicator:

Indicator 1: **Professional Development/Systemic Improvement**. Professional development focuses on individual, collegial and organizational improvement.

- My professional development activities focus on teachers as central to student learning yet include other members of the school and community. **(2)**
- My professional development activities focus on individual, collegial and organizational improvement. **(4)**
- Staff development is viewed as an essential component for achieving the goals of my school and is valued as an integral part of my school. **(4)**

Indicator 2: **High Quality Content**. Professional development helps teachers teach to teach to state and national content standards and reflects best available research in teaching and learning.

- My professional development activities encourage teachers to be active, investigative, reflective practitioners. **(2)**
- My professional development activities reflect best available research and practice in teaching, learning and leadership. **(4)**
- My professional development enables teachers to develop further experience in subject content, teaching strategies, uses of technology, and other essential elements in teaching to high standards. **(4)**

Indicator 3**: Support During Implementation.** Professional development is ongoing, collaborative, and supportive of the implementation into institutionalization of new strategies.

- I am involved in collaborative planning on a weekly basis. **(3)**
- Teachers are organized into support teams during implementation of new content or teaching strategies. **(2)**
- My professional development activities support me through the institutionalization of a new teaching strategy. **(4)**
- My professional development includes follow-up activities that allow me to reflect upon the impact of a new strategy. **(3)**

Indicator 4**: Data-Driven Professional Development**. Professional development is determined through a data collection and analysis process.

- I reflect on and utilize my own classroom data to plan instruction strategies. **(2)**
- Our staff development decisions are based on data regarding positive student achievement outcomes. **(3)**
- Reading, studying and discussing student needs and the best strategies to meet those needs precedes decisions concerning staff development. **(3)**
- My students' achievement indicates that my staff development activities have lead to increased student learning. **(2)**

APPENDIX G

APPENDIX H

Grades 9-12 Reading Findings

The following table illustrates benchmarks that present a concern due to the number of teachers feeling uncomfortable with content and the number of teachers who are either **NOT** teaching the benchmark **or if** teaching, say that even with instruction and practice, students are having a difficult time learning the identified benchmarks.

Note: Responses of grades 9-12 teachers of reading courses open to ALL students (including teachers of Title I and Advanced Reading courses) are represented in the table below.

This chart represents the 131 high school teachers of reading who responded to the survey.

Legend: Each benchmark of concern is labeled in the following table with one of two symbols.

● Indicates benchmarks that teachers feel **uncomfortable** with regard to content and report **NOT** teaching **or if** teaching, say students have a difficult time learning.

∞ Indicates benchmarks that teachers **DO** feel **comfortable** with regard to content, but report **NOT** teaching **or if** teaching, say students have a difficult time learning.

STANDARD 1: Students construct meaning as they comprehend, interpret, and respond to what they read.	**% Of Grades 9-12 Teachers Who Are NOT Comfortable With Their Content Knowledge**			**Teachers Who Do NOT Review Or Teach This Concept Or Skill**				**% Of Teachers Who Say Students Have A Difficult Time Learning The Benchmark**			
	Percentage			**% NOT Currently Teaching**				**% Responding as Above**			
	10-15	**16-20**	**>21**	**10-25**	**26-35**	**36-45**	**>45**	**10-25**	**26-35**	**36-45**	**>45**
1.1 make predictions and describe inferences and connections within material and between new material and previous information/experiences.	●						●		●		
1.2 integrate new important print/non-print information with their existing knowledge to draw conclusions and make application							∞	∞			
1.3 provide oral, written, and/or artistic responses to ideas and feelings generated by the reading material, providing examples of the way these influence one's life and role in society.	●						●	●			
1.4 demonstrate understanding of main ideas and formulate arguments using supporting evidence.	●						●	●			
1.5 accurately paraphrase reading material, reflecting tone and point of view.	●						●		●		

STANDARD 2: Students apply a range of skills and strategies to read.	**% Of Grades 9-12 Teachers Who Are NOT Comfortable With Their Content Knowledge**			**Teachers Who Do NOT Review Or Teach This Concept Or Skill**				**% Of Teachers Who Say Students Have A Difficult Time Learning The Benchmark**			
	Percentage			**% NOT Currently Teaching**				**% Responding as Above**			
	10-15	**16-20**	**>21**	**10-25**	**26-35**	**36-45**	**>45**	**10-25**	**26-35**	**36-45**	**>45**
2.1 decode unknown words combining the elements of phonics, grammatical structures, analysis of word parts, word connotation, and denotation of context to understand reading material.		●					●			●	
2.2 identify, analyze, and evaluate literary elements (e.g., plot, character, theme, setting, point of view, conflict).	●						●	●			
2.3 identify, analyze, and evaluate the use of literary devices (e.g., figurative language, exaggeration, irony, humor, dialogue, satire, symbolism).	●						●		●		
2.4 use features and organization of fiction and nonfiction materials to comprehend increasingly complex material (e.g., paragraphs, chapters, titles, indices, tables of contents, graphs, charts, visuals, and methods of organization).							∞		∞		
2.5 adjust fluency, rate, and style of reading to content and purpose of the material.	●						●		●		
2.6 develop vocabulary through the use of context clues, analysis of word parts, auditory clues, and reference sources, and expand and refine vocabulary related to specific academic areas, culture, and technology.	●						●		●	●	
2.7 use a variety of reading strategies to comprehend complex material, including self-correcting, rereading, using context, and adjusting rate.	●						●			●	
2.8 ask questions, check predictions, summarize, and reflect on information to monitor progress while taking responsibility for directing one's own reading.	●						●		●		

STANDARD 3: Students set goals, monitor, and evaluate their progress in reading.	**% Of Grades 9-12 Teachers Who Are NOT Comfortable With Their Content Knowledge**			**Teachers Who Do NOT Review Or Teach This Concept Or Skill**				**% Of Teachers Who Say Students Have A Difficult Time Learning The Benchmark**			
	Percentage			**% Not Currently Teaching**				**% Responding as Above**			
	10-15	**16-20**	**>21**	**10-25**	**26-35**	**36-45**	**>45**	**10-25**	**26-35**	**36-45**	**>45**
3.1 articulate and evaluate strategies to solve reading problems, self-monitor progress, and direct one's own reading.			●				●				●
3.2 analyze reading successes and attainment of reading goals.	●						●		●		
3.3 select authors, subjects, and print and non-print material, expressing reasons for recommendations, and information and insights gained.	●						●		●		

STANDARD 4: Students select, read, and respond to print and non-print materials for a variety of purposes.	**% Of Grades 9-12 Teachers Who Are NOT Comfortable With Their Content Knowledge**			**Teachers Who Do NOT Review Or Teach This Concept Or Skill**				**% Of Teachers Who Say Students Have A Difficult Time Learning The Benchmark**			
	Percentage			**% Not Currently Teaching**				**% Responding as Above**			
	10-15	**16-20**	**>21**	**10-25**	**26-35**	**36-45**	**>45**	**10-25**	**26-35**	**36-45**	**>45**
4.1 integrate purposes for reading into daily life (e.g., personal satisfaction, lifelong reading habits, reading as a leisure activity, sharing, and reflecting upon the reading).							∞		∞		
4.2 read to evaluate appropriate resource material for a specific task.							∞		∞		
4.3 locate, read, analyze, and interpret material to investigate a question, topic, or issue (e.g., reference material, pamphlets, book excerpts, articles, letters, and electronic information).	●						●		●		
4.4 read, analyze, and synthesize information to perform complex tasks for a variety of purposes (e.g., schedules, maps, instructions, consumer reports, and technical manuals).	●						●				●
4.5 read and analyze works of various authors (e.g., diverse cultures, perspective and issues, recurring themes).	●						●		●		
4.6 read, evaluate, and create material and documents related to social and civic responsibilities (e.g., letters to the editor, posters).	●						●		●		
4.7 locate, read, analyze, and evaluate information from a variety of sources (e.g., manuals, instructions, flowcharts, television, Internet).	●						●		●		

STANDARD 5: Students gather, analyze, synthesize, and evaluate information from a variety of sources, and communicate their findings in ways appropriate for their purposes and audiences.	**% Of Grades 9-12 Teachers Who Are NOT Comfortable With Their Content Knowledge**			**Teachers Who Do NOT Review Or Teach This Concept Or Skill**				**% Of Teachers Who Say Students Have A Difficult Time Learning The Benchmark**			
	Percentage			**% Not Currently Teaching**				**% Responding as Above**			
	10-15	**16-20**	**>21**	**10-25**	**26-35**	**36-45**	**>45**	**10-25**	**26-35**	**36-45**	**>45**
5.1 compare and contrast information and broad themes within and among a variety of information sources.	●						●		●		
5.2 logically synthesize information from a complex range of print and non-print sources	●						●				●
5.3 apply basic principles of formal logic to print and non-print sources		●					●				●
5.4 analyze use of evidence, logic, language devices, and bias as strategies to influence readers.			●				●				●